

The

CHRISTMAS NUMBER 1952 2/6

GEOGRAPHICAL

MAGAZINE



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Agriculture and the Export Drive

by SIR GERALD BARRY

Editor of the News Chronicle from 1936 to 1947, Sir Gerald Barry was Director-General of the Festival of Britain 1951 and is now adviser on public policy to the National Farmers' Union, charged with the duty of helping a town-minded people to appreciate the importance of British agriculture

It is almost impossible nowadays to pick up a newspaper without reading something about the need to grow more food at home. The British farmer has suddenly become "news". This is a good and welcome change, for the importance of increased agricultural production is both real and urgent, in spite of the fact that a great deal has already been done, both by more efficient farming and by putting new acres under the plough: soon British agricultural production will be 60 per cent above the pre-war figure. But there is another side to this effort, and an important one, which is usually overlooked. It may seem paradoxical at first sight to mention the word "exports" in connection with British agriculture. After all, rather more than half of the food we need has still to be imported. All the same it is true that efficiency and expertness on the part of the British farmer, and of those manufacturers who cater for him, have an indirect value to our export market, a value which in total is quite considerable.

The best-known British agricultural exports, famous almost the world over, are of course our celebrated bloodstock—horses, cattle, sheep and pigs. Of the twenty most famous breeds of horses and livestock in the world, all but three are British bred. In many countries where these breeds are in use they need regular re-infusions of British blood to keep them up to standard. For a century or more British livestock have been famous throughout the world: it would be interesting to assess, if it could be done, precisely how much they have had to do with improving the world's beef supplies. It must have been prodigious. Over the years the introduction of British bloodstock into other countries has resulted in the setting up of entirely new farming industries, with all the industrial development that goes with it—canning, chilling and shipping.

In terms of actual cash, the value of British bloodstock exports is not great, only some £6,000,000 a year; but its prestige value is enormous and its value in improving the

world's supply of meat is incalculable. Just as we have been the great human colonizers of the undeveloped spaces of the earth, so from the same villages and farms from which went forth these pioneers to America, Australasia and Africa have also gone forth famous *animal* colonists, which now, intermarried with other breeds, populate in vast numbers the farmlands of the world. In a sense it could be said that when we buy Argentine beef or Australian mutton we are re-importing—across great distances of space and time (and at high cost!)—the meat originally reared on our own home farmsteads.

Nothing to do with the land is new. As with bloodstock, so with other things, the story of current achievement goes back to early enterprise and invention. One of Britain's most useful agricultural exports—though again not one that reaches a very significant volume in terms of dollars—is fertilizers and various kinds of insecticides, weedkillers, and so on. Together the export value of these chemicals stands today at a figure of about £14,000,000 a year, and the fact that they exist is due to British research that reaches back at least a hundred years.

By the 1840s the idea of using science to improve the growth of crops was already well under way. In the early part of the 19th century at Rothamsted, now world-famous as an agricultural research centre, Lawes was applying to the fields of what was then his family estate the most recent laboratory discoveries of his day. It was his enterprise that was largely responsible for the present-day manufacture on an enormous scale of artificial manures. In the 1840s Britain was *importing* manures—nearly 250,000 tons of guano a year. Nowadays Britain manufactures some 250,000 tons of nitrogenous fertilizers every year and exports about one-fifth of them. If it were not for the science of the past in discovering and perfecting these chemicals, and the efficiency of the present in making use of them at home, we should not



Sport & General

The British farmer's best-known contribution to British exports is bloodstock—horses, cattle, sheep and pigs—worth some £6,000,000 a year. Constant competition in the prize-ring maintains its high quality.

(Above) Judging Suffolk brood mares at a 1952 show. (Below) Aberdeen Angus cattle in the ring at Perth

Sport & General





P. K. McLane

Buyers from all over the world attend these shows and pay top prices for picked beasts of pedigree stock. (Above) American and Canadian buyers with a keen eye for prize-winners at one of this year's Perth shows. (Below) Some buyers go direct to the farms: a Lincoln ram being examined by experts from the Soviet Union

Picture Post Library



be able to sustain a manufacturing industry which makes these exports possible.

Many of the discoveries and developments of those days, which did so much to improve food-production not only at home but all over the world, occurred under the impetus of a golden age for British agriculture. This coincided with the great period of all-round development that followed the first use of steam power, and it persisted for some years even after the repeal of the Corn Laws had hit the home farmer so hard. New methods were being applied everywhere, new crop rotations, new farm buildings laid out on scientific lines, new agricultural machinery run by primitive steam power. The first steam plough came in 1856, the first attempts at rotary cultivation followed a year or two later. Although the repeal of the Corn Laws delivered a body-blow to the corn-growing farms of England, a rapidly rising population and the general atmosphere of expansion in

the world still continued for a while to provide a stimulus to the innate aptitudes of the British farmer. But the time was soon to come when the soils of new lands brought under cultivation—and peopled, be it noted, with British livestock!—began to provide a superabundance of cheap meat and grain for export, and “high farming”, like the heroine of a Victorian novel, fell into a decline.

Since then British farming has had several ups and downs, chiefly downs, with prosperous intervals caused by sudden threats of starvation. When wars came the people of the Island Kingdom wake up to the importance of their own soil. So it was in World War I, and even more so in World War II. But whereas the first war was followed by another slump in farming, after World War II the world shortage of food, and our inability to pay for it even if it were available, has placed new responsibilities and new opportunities upon British agriculture. The siege

conditions of wartime are continued in the days of so-called peace. Now it so happens that the period coincides with great scientific advances. If the capital required for the full development of these resources were forthcoming, British agriculture might be about to enter a new golden age.

One of the most impressive improvements during the last war was the rapid mechanization of our farms. Although I believe it is true that the first tractor ever to rumble over the soil of this planet did so in an Essex field, by and large the early development of mechanized farming by means of the petrol engine was an American prerogative. Before 1939 a combine-harvester was still a comparative rarity in Britain, even tractors were by no means ubiquitous; the horse still reigned. In twelve years a revolution has been completed. Today the horse has become almost an unusual figure in the English farming landscape. You may travel all day along English roads and encounter



L. S. Williams

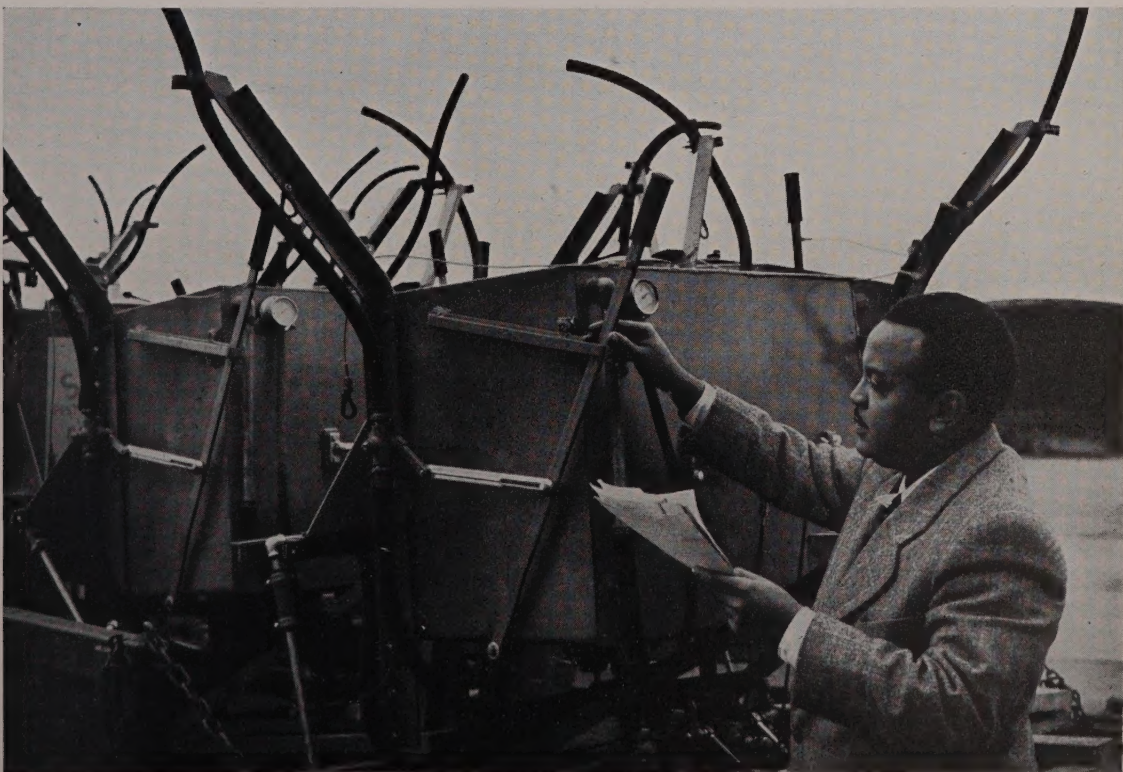
An emigrant embarks for Australia: one of the Hereford bulls that are regularly exported to keep up the standard of this breed, a favourite among beef cattle in North and South America as well as in Australasia



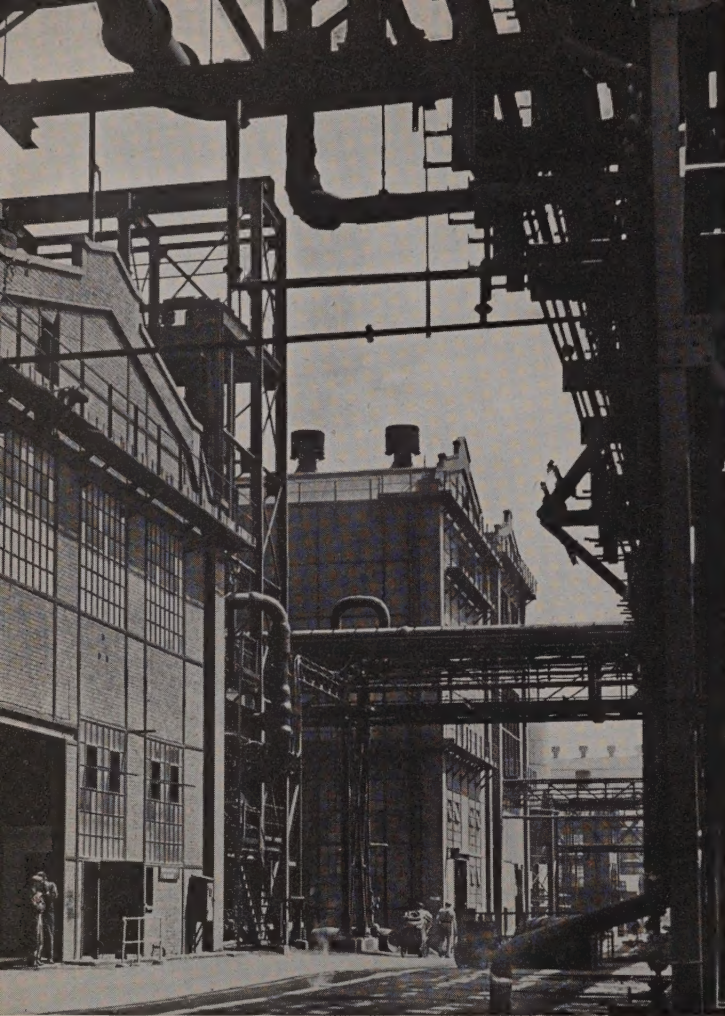
By courtesy of Pest Control Ltd



Insecticides, weedkillers and spraying equipment form an increasingly significant British agricultural export. (Above) A Hiller helicopter sprays cotton crops for insect control in the Sudan, guided by a marker. (Below) "Weedmasters" for attachment to tractors are checked before export to the Sudan



By courtesy of Pest Control Ltd



by courtesy of Imperial Chemical Industries

British chemicals for agricultural use to the value of about £14,000,000 are exported every year. The greater part consists of artificial manures, especially nitrogenous fertilizers. The British farmer's efficiency sustains the home market without which the export industry could not exist. (Left) The ammonia buildings of Imperial Chemical Industries at Billingham. (Opposite) Inside a silo for storing 100,000 tons of sulphate of ammonia

hardly a sign of the once-familiar evidence that the road was a highway for horseflesh.

Today British agriculture is, as it was a hundred years ago—but how differently!—the most highly mechanized in the world. For the equanimity of English manufacturers too many mechanized vehicles on British farms still bear a foreign, usually an American, trade-mark, but British production is forging ahead and (stimulated by the demand of the home market) our factories are now exporting in profitable quantities. Even if trade slumps cause a fall in the exports of domestic or family motor-cars—if that be the term to describe the ordinary automobile—the soil must still be ploughed and reaped so the demand for tractors continues. Motor manufacturers have thus a valuable auxiliary support for their exports.

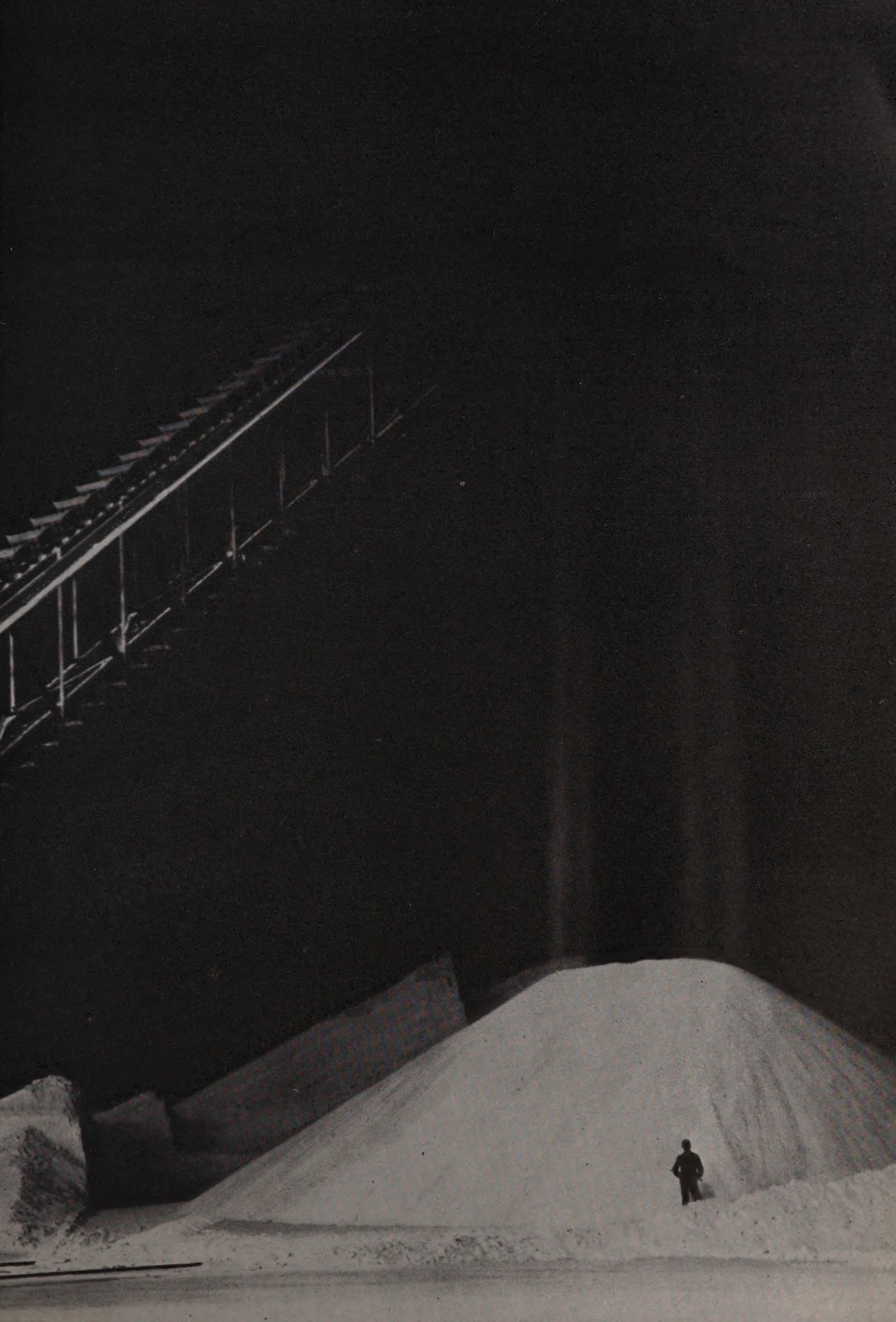
Of "agricultural" exports, machinery is by far our largest. Last year we exported nearly £60,000,000-worth out of a total production of £107,000,000, or more than half. Where does this machinery go? One would not ex-

pect it to go in any large quantities to either North or South America, where the U.S. manufacturers have perhaps naturally established a near-monopoly. Much of it goes to Europe, a good deal of it to the Near and Far East and to Africa, and a great deal to Australia and New Zealand, although these last two countries are now partly supplied from their own factories, a fact which is likely to limit the future expansion of exports in that direction. And here is a sad fact which has to be recorded: a recent survey of machinery in use on wheat farms in a part of Australia, which showed that 70 per cent of the tractors were American, only 19 per cent British and the rest

of European or local make, revealed that a majority of the farmers declared a preference for American machines largely on account of the *after-sales service provided by their manufacturers*. How often, alas, do we still hear that the excellence of a British product remains at a competitive disadvantage in the markets of the world because of obsolete salesmanship or service by the makers!

Besides tractors, British factories export other, more specialist machines. As colonists we have developed markets for tropical farming equipment. We also export machinery for tea estates, though this is principally for processing rather than cultivation; and a British inventor has recently perfected a machine for picking the leaves of the tea plant, a device which it was said could never replace the sensitive touch of the human hand. Whether this machine has yet been proved a success I do not know, but its existence shows that the enterprise of our people in this field of invention is not drying up.

Where can our manufacturers find new





y courtesy of Harry Ferguson Ltd

British agriculture is the most highly mechanized in the world. Its demands have stimulated the production of machinery for export worth £60,000,000 a year. Much of this is standard material similar to that designed for use in the home market. (Above) Ferguson tractors on their way to the United States



By courtesy of Ransomes, Sims & Jeffery

Agricultural machinery specially designed for export. (Above) Ransomes developed the Supertrac plough to reclaim a vast area in India made derelict by Kans grass: no other plough would cut through its roots. (Below) The Rotavator is exported to 69 countries: one model rivals the buffalo in Siamese rice-fields

By courtesy of Rotary E





By courtesy of The Rover Company Ltd

Primarily intended to serve the British farmer, the versatile Land-Rover is in strong demand overseas and has given a lead to the British motor-car industry in a fresh direction. Besides providing a mobile power-plant for many purposes, it tows a trailer load much exceeding its own weight

and expanding markets for their numerous agricultural exports? In a world in which population is increasing much more rapidly than food production—a world in which, according to the fashionable experts, we are *all* likely to be hungry within a measurable time—there must surely be plenty. In some of the most densely populated areas of the world where improved agricultural methods are blatantly overdue, markets are still blocked by financial difficulties, difficulties of distribution, and the restrictions imposed by the continuance of small peasant holdings, which, without cooperation, cannot easily provide the capital for rapid development. But as the results of aid under Point Four of the Truman Plan begin to take effect, the demand for farm implements from backward territories should increase; while in many countries of the Far East, such as Burma, Ceylon, India and Indonesia, as well as French North Africa and a good many more, government programmes are being carried out which will certainly lead to a gradual increase in the demand for agricultural machinery, as well as perhaps for chemicals and for bloodstock. In countries with a rising standard of living and an increasing industrialization, where workers leave the land for

the greater alleged attractions of the city, labour-saving machinery for the farm is becoming an increasing need. This is happening particularly in Mexico and in the Republics of South America.

As for Europe, the West and the North are now fairly well mechanized; the East and the South will offer handsome fields for increased exports once conditions there create a brisker demand. At the present time, backwardness and ignorance, the small units of peasant holdings, the lack of both knowledge and capital to improve efficiency, hold back the progress of farming throughout most of the Eastern and Mediterranean areas of Europe. The miserable politics of the Cold War also have the effect of restricting trade with countries east and south of the Iron Curtain. Before long, no doubt, German and even Japanese machines will also be crowding the world market.

But with the whole globe clamouring for more food, more cheaply and efficiently produced, there are bound to be, for decades at least to come, almost limitless opportunities for agricultural development in all five continents. In speeding this development the long-proved quality of our farming exports should surely play a valuable and increasing part.

The Chinese Coffin Tree

by F. KINGDON-WARD, O.B.E.

Mr Kingdon-Ward's adventures as a botanical explorer are known to a wide public through his books and broadcasts. In the past twenty-five years he has paid four separate visits to the remote mountain region separating Burma and China and, accompanied by his wife, has just begun a fifth

CHINA possesses the richest temperate flora in the world. This is no doubt in part due to the fact that it is a large country with infinite diversity of soil, climate and topography, the latter including plains, hills, and snowy mountains. But that is not enough by itself to account for so remarkable a flora. The U.S.A. is as large as China and its surface is as varied. So—which is more to the point—is the surface of Central Europe. Yet neither of these temperate areas has anything approaching the diversity of the Chinese flora. We must seek another cause, and we find it unmistakably in the ageless existence of China as a land surface throughout the greater part of geological time, and to a singular conjunction of geographical factors which operated during the Pleistocene Ice Age. As a result, while much of the European flora at the north-western extremity of the continent was being slowly but methodically wiped out by the advance of the Polar ice-field, in the Far East the flora found an easy escape route via a continuous land surface into the tropical zone.

Nor was that all. Not only were the refugees able to escape and mingle with the sub-tropical flora further south, and beyond range of the creeping cold, but when the climate improved and the pressure of the cold relaxed, they were able to drift northwards again, accompanied by part of the tropical flora which had never before ventured so far north.

Had Europe as a whole been placed 15° or 20° further south, thus corresponding more closely with the latitude of China, its flora might today have been almost as rich. For though it has been maintained that the European flora was squeezed between the advancing ice and the alpine chain which lay athwart its route to the south, barring its progress with a second ice front, yet the mountain chains and deserts of southern Asia also trend athwart the southern routes, and must equally have barred the way—though admittedly the Eastern Asiatic flora had far more room than had the European in which to manoeuvre.

But to call for a last stand in latitude 50° is very different from calling for a last stand

in latitude 30°. The wide belt of warm-temperate flora which originally surrounded the polar basin, when stretched, cracked open, and was pushed southwards by the advancing cold front, following such routes as it could; otherwise it perished. Naturally the routes diverged, and the once continuous flora became split into isolated wedges. That Europe had a pre-glacial flora comparable with that of China is clear from the fossil evidence, and that despite 20° difference of latitude.

The Chinese flora today is unique, and its uniqueness consists in the possession of families and genera of flowering plants—and especially of naked-seeded trees (Gymnosperms)—peculiar to itself. Only in the eastern Himalayas and in the chain of islands extending from Sakhalin via Japan and Formosa to Hainan, do we find extensions of this Eastern Asiatic flora outside China proper.

Such then is the background against which we must view the immensely rich botanical wealth of China, and from which during the past 125 years we have been diligently restoring our own lost treasures, to readjust the balance between east and west. Today our parks and gardens glow again with the magnolias, camellias and conifers which, but for the Ice Age, would have been Europe's by right.

The name "living fossil" was given by Charles Darwin to some of the ancient trees which live on today in remote corners of the world (and particularly in China), but which, it is clear from fossil evidence, in an earlier epoch covered whole continents. These trees—the Chinese maidenhair tree, or Gingko, is one of them—trace their ancestry back not simply to pre-glacial times, a mere million years or so, but to the beginning of the Tertiary Epoch perhaps a hundred million years ago, to the Secondary Epoch, many millions of years before that, and in a few cases even back into the Palaeozoic, which is of the order of a thousand million years ago; but by then figures have ceased to mean anything—time stands still.

China is rich in such living fossils. Less than a decade has passed since the discovery



photographs by the author

In the coffin tree country of North Burma: a suspension bridge over a tributary of the Irrawaddy, made of pliant canes from a climbing palm

mens to Tokyo, where it was recognized for a new genus, and named *Taiwania* in honour of the island on which it grew, called by Westerners Formosa (the beautiful), but by the Chinese Taiwan. A specific name *cryptomerioides* was added, to emphasize the fact that, outwardly at least, the new tree resembled the Japanese *Cryptomeria*, another monotypic genus.

No fossil *Taiwania* is known, and the discovery of yet another conifer in the Far East, so rich in endemic conifers, aroused no particular interest outside botanical circles, though the Arnold Arboretum of Boston, Massachusetts, took pains to introduce the new tree into America. That was in 1912, and shortly afterwards it came to England, where there are now several good specimens.

Meanwhile *Taiwania* had been discovered far in the interior, some 1500 miles to the west, on either side of the Burma-China frontier; that is to say, in Burma on the one side, within the drainage basin of the Irrawaddy, and in Yunnan on the other. That left a considerable gap between the two localities where the tree was not known to occur; in other words, its distribu-

tion was discontinuous. But the intervening country had not been well explored.

It appeared certain that *Taiwania* had in an earlier age been distributed right across China from Formosa to Burma (and if so, why not as far west as Assam?), and that probably within historic times. It seemed only too likely that man himself had exterminated it from all accessible areas. Since World War II it has at last been discovered in central China, thereby strengthening the continuous distribution theory.

I have several times travelled in the precipitous country of the eastern Irrawaddy, where *Taiwania* still grows along the Chinese frontier over a distance, from north to south, of nearly 200 miles. This country is, and

of the tree called *Metasequoia*, living on in obscurity like a holy hermit, immeasurably old; for the genus *Metasequoia* was known long before anyone had any idea that it might conceivably exist other than in the fossil state. Thus a tree whose ancestors lived millions of years before man appeared on the earth, millions of years before *any* mammal appeared, had survived for thousands of generations, almost unchanged, in its last stronghold in the heart of ancient China, still unsubdued.

In 1904 a Japanese botanist, collecting plants on Mount Morrison in the island of Formosa, found a strange conifer, unknown to him. It was by far the tallest tree he had seen in the island, nearly 200 feet high and towering over all other forest trees. He sent speci-

always must be, very sparsely populated, for there are only pockets of arable land. I wanted to look into the occurrence of the tree in northern Burma, and obtain information on the Chinese monopoly, which centres round the tiny village of Kangfang on the upper reaches of the Ngawchaung river, a tributary of the eastern Irrawaddy.

Leaving Myitkyina in April at the beginning of the hot weather, I crossed the Irrawaddy below the confluence of its two branches and followed the eastern into the mountains. Here I met all kinds of hill people—hunters, traders, medicine-gatherers, wood-cutters—going about their simple business. They belonged to several tribes, who dwell at different levels, stratified by the climate, which is of course very different down by the river at an altitude of 1500 feet and at 7000 feet where cultivation ceases.

One day we met a man with a dozen sad-looking dogs, which he drove before him like a circus team of ponies. It was my first encounter with a Lisu.

"Where are you going?" I asked him.

"I'm going into the Maru country."

"What are the dogs for?"

"I'm going to sell them to the Marus."

"Haven't the Marus got any dogs?"

"Of course they have. They need them to watch their huts when they're out all day and to warn them of wild animals at night. They also eat dogs. I'm taking these worn-out dogs to sell for food."

To eat the friend of man seems a poor sort of gratitude; yet it would be difficult to make out a case for eating one sort of domestic animal and sparing another.

Approaching Kangfang, on the fourteenth day from Myitkyina, now following the Ngawchaung river towards its source in the frontier ranges, suddenly, where the river flowed just out of sight below its high bank, I spied several objects moving along, apparently with the stream, and bobbing up and down in a strange manner.

"Good heavens, Lupting!" I said to my interpreter, "what on earth's that?"

"What are you looking at, sir?"

"Why, those things bobbing along on the river."

We went to the bank, and the river itself came into view; the mystery was immediately solved. The bobbing objects I had seen were the heads of men riding timber rafts. Each raft was composed of four heavy planks in two pairs, loosely hinged together like the covers of a book. The one-man crew straddled it with a foot on either half, and fended it off the rocks with a long bamboo furnished with a grab-hook at the end. Thus they shot swiftly through the rapids, and presently came ashore below Kangfang. Here the rafts were dismembered and the planks carried up to the village, some being loaded onto mules, others borne on men's backs. Not only were they of great bulk, and heavy, but also of peculiar shape—broad and rounded at one end, tapering towards the base, where they were cut square. I realized at once that they were in fact coffin planks. I was in the heart of the coffin-plank industry.

The country was wild, high and steep. Even Kangfang at the very bottom of the valley was 5000 feet above sea level, and the surrounding mountains quickly reached 13,000 or 14,000 feet. Any further exploration would



A. J. Thornton

(Right) *A 30-year-old coffin tree in the Botanic Garden, Maymyo, Upper Burma. It was then about forty feet high. Growing in the open, its lower part displayed the "attractive pyramidal habit, the weeping branches curling at the ends".*

(Below) *In the evergreen hill jungle the base of a full-grown coffin tree is bare, exposing the reddish stringy bark which recalls that of the American redwood. This specimen, some 250-300 years old, measured eighty feet to the first branch, rising about another hundred feet above the forest canopy*





The Lisus of the Burma frontier are the initial exploiters of the coffin trees scattered about the jungle. Their standard equipment includes a cross-bow of four-foot span, a jungle knife in wooden half-scabbard, a bag of black bear skin and arrows, with vanes of flattened straw, stuck in the turban

have to be done on foot. My main desire was to see a full-grown coffin tree; but I also wanted to learn what I could about this ancient industry, which was still carried out on mediaeval lines.

The standard of living in the peasant economy of China is low, and not many persons can afford expensive coffins, even if they were available in sufficient numbers. But every family does what it can, and will starve rather than fail in its duty to provide the head of the family with a fashionable funeral and a favourable interment, as recommended by the village oracle, according to the prediction of *feng-shui* (literally "wind and water", or as we might say, omens).

Only a strong coffin of some aromatic wood like Liquidambar, or of coniferous wood like Cunninghamia or Taiwania, can be trusted to protect the dead for several years, between burial and cremation (as is the Chinese way); and in a country so completely deforested as China, few trees remain. First-class coffins are therefore costly.

Another reason for having a nice-looking coffin is that before use it becomes part of the household furniture. The head of the family at least buys his coffin in good time, and sets it aside until wanted.

I asked Lupting to find a coffin tree, but he said there were none near Kangfang and the industry, it seemed, was rather hush-hush. But by staying on at Kangfang and making discreet enquiries I found out a little; and of course I could see the planks arriving, and drying against the walls of the huts, and being sent off on the backs of Lisu porters.

The largest planks, which form the top and bottom of the coffin, are seven or eight feet long, two-and-a-half feet wide at the rounded end, tapering to one-and-a-half feet at the narrow end, and about two inches thick. They weighed eighty or ninety pounds. The two side planks are smaller. The two end pieces, though only about a foot square, are much thicker than the planks, being convex with a central boss. The finished coffin might weigh between 300 and 400 pounds.

But no precision or finishing work was done at Kangfang; only rough planks were cut. The industry was simply but efficiently organized. Every cold season a Chinese firm (one of the cooperative guilds or *hongs*) sent over carpenters and lumbermen, who went to predetermined trees, felled them and cut the planks (skilled work which could not be entrusted to the local tribesmen, who anyway did not possess the necessary tools). But it was the tribesmen who floated

them down the Ngawchaung river, and who carried them one by one from Kangfang over the mountains. This was a stupendous feat, carrying an eighty-pound plank over a 10,000-foot pass by a steep rocky track, and the journey rarely took less than eight days.

At Tengchung (which used to be called T'eng-yueh) or some such Chinese town, the fine work is done. The planks are planed, fitted together and lacquered, the finishing touches being put on with gold paint. The coffin is then ready for sale, and it may go as far afield as Canton or Nanking, which of course adds greatly to its cost.

I saw several Lisus, big bony men with a rather Red Indian cast of feature, starting off for China with planks on their backs. Each shuffled slowly along under the weight, the plank projecting beyond his head, so that from the side he resembled some prehistoric monster moving cautiously. He carried also a bamboo staff with which to prop up the plank while he rested, and in a basket attached to the plank was an extra wrap for the night, and food for several days.

It is clear that only a very large tree could yield planks of coffin size; and though there must be a great waste with the rather primitive tools used, a tree which yields sixty or seventy planks of all sizes is worth a lot of money.

It was from the Lisus I learnt where the trees came from. All trees which were easy to reach had long since been cut down and cut up, and nobody thought of planting more. The trees which remained were far up the river gorge, several days' journey distant. It seemed likely that in a comparatively short time, as it became necessary to go still further, the cost of extracting the timber would become prohibitive, and the industry would gradually fade away. For Taiwania does not form pure stands; the trees are scattered about in the broad-leaved evergreen forest, and are nowhere abundant.

And yet, I am not sure. The Chinese are an enterprising and hard-working race, and they hate to waste anything. It may be that so long as there is a coffin tree standing, no matter how remote and inaccessible it is, they will ferret it out and turn it into coffins, adjusting the economics of the industry to the heavier charges somehow, though the profit is pared to the bone. In that case the best hope for survival of the species is the fact that it is useless to fell the tree before it is full grown, and young ones may be coming on. But never again will Taiwania be abundant in Burma—unless it is planted.

The coffin trees are cut in the forest and sawn into planks by the Chinese; but it is the Lisu tribesmen who float them down the rivers and carry them across the border. (Below) Lisus riding coffin-plank rafts on the Ngawchaung river. Each raft is made up of four such planks bound together with lianas. (Right) A Lisu with his load of a single coffin plank weighing eighty or ninety pounds. He will carry it, supported on a headband and yoke, for perhaps a week along the steep rough mountain trail into China





After their journey downstream the coffin planks are brought ashore and loaded onto Chinese mules for transport two at a time (a full mule-load) to Kangfang village, situated a few hundred feet above the Ngawchaung river. Here they are seasoned for a time before being carried over the mountains to China



It did not seem worth while to go any further up the Ngawchaung in the hope of seeing a mature coffin tree; the country was so precipitous that the chances of getting close enough to see one properly were extremely poor. But at this point Lupting came forward and told me there was a tree just across the river!

"How far away is it, Lupting?"

"An hour's journey, sir."

I was frankly incredulous. "You're dreaming," I said. "It isn't a coffin tree at all; it's some common tree you've seen." (Lupting's botanical knowledge was not extensive.)

Next morning he reappeared with a great branch of some coniferous tree I had never seen before.

"Where did you get this from?" I asked him.

"From across the river, quite close."

That disposed of Lupting's dream and I went with him to see the tree, crossing the cane bridge, which swayed to and fro in the breeze in the most sickening manner.

We came presently to a small Lisu village hidden in a glen. Lupting stopped.

"Look, sir," he said, "the coffin tree."

I looked with a sense of dawning disappointment. Yes, there it was, with its attractive pyramidal habit, the weeping branches curling up at the ends like the corners of a Chinese temple roof, each one rigidly tiled with little overlapping needle-leaves like a hedgehog. But it was a miniature, a seedling, barely twenty feet high; not much taller than a fair-sized Christmas tree, or the pear tree nearby. The trees from which those enormous planks had been cut must have looked very different. I voiced my feeling of frustration.

"I want to see a full-sized tree; surely there must be some not very far away, with all this forest," I remarked.

But Lupting said that the Chinese were suspicious, and though quite friendly, were always charmingly vague when it came to locating *hsiang mu shu* ("the scented-wood tree") as they called it. At this point a pleasant-looking Lisu came forward and asked me if I wanted to see a big tree.

"I do very much," I replied.

He became conspiratorial, and whispered to us. He had a friend who owned a tree. He was sure his friend would show it to us if we would arrange to go to his village, about two days' journey down the valley. He himself was starting for the place immediately; if we liked to go along next day, he would be pleased to make all arrangements.

It proved—for me—three days' hard march to the village which was situated at some height above the Ngawchaung river. We arrived in the evening, and early next morning set out for the spot. The mountain-side was very steep, and covered with pine and bracken for several thousand feet; but the deep gullies were filled with mixed broad-leaved forest. We followed a rough track. Two Lisus armed with their big knives led the way, cutting through the tangled undergrowth where necessary. It was a stiff climb, and I puffed along well in the rear. After ascending about 2000 feet the slope grew yet steeper, and almost the only trees were pines, which grew scattered amongst great boulders. Thick forest seemed a long way off. We were now 7000 feet above sea level.

At this point our guides halted. Over to our right was a gully, wide and deep, and when we had parted the bushes, which screened it from view, I saw that it was filled with mainly broad-leaved forest. We stood on the brink of a precipitous slope, and the Lisus quickly felled some small trees in the foreground. Then, about fifty yards down the slope, there came into view a stout red-barked tree, straight as an arrow, and of great height. Up, up it soared, with never a branch for eighty feet, till its crown pierced the canopy, towering over all its neighbours as a church steeple does above cottage roofs. It must have been nearly 200 feet high. There was no doubt what it was, and I felt a thrill at sight of it. A full-grown coffin tree, *Taiwania cryptomerioides*, the *hsiang mu shu* of China—and of Burma too.

I scrambled down the slope to it and felt the stringy bark—it reminded me of the American redwood *Sequoia sempervirens*—and chopped out a small splinter of wood for microscopic examination. I also photographed the tree, though it was impossible to get it all in at once.

I was interested to learn that these scattered trees were owned by individual tribesmen, who had discovered them. They sold them to the Chinese contractors. I asked my Lisu friend if he had sold this tree and, if so, for how much. He said no, he intended to leave it for a few years till it was bigger still, when he would get more for it.

"How much?" I asked.

He did not know; perhaps a hundred rupees, perhaps more; Rs.150 was a fair average price for a big tree. I hope that *Taiwania* is still there. It might be, since it would be a difficult one to extract, even for the ingenious Chinese.

Geo-Brolliology or Climate and the Umbrella

by DAVID PIPER

BROLLIOLOGY, the science of the umbrella, awaits development. It owns no Nuffield professorships, no Rockefeller research studentships; it exists, if at all, still nebulous, in one of the loftier intellectual atmospheres, into which even the aspiration of post-graduate scholarship in search of a thesis has yet to penetrate. It would therefore be foolish, and presumptuous, to attempt to outline the course this science will take: field-work has hardly begun: fundamentals remain to be stated. My purpose is simply to indicate that the subject might be, and, that once recognized, it too will affect the geographer.

Any consideration of the umbrella must of course involve the study of climate. Here is a fundamental. Without sun and rain, the umbrella is nonsense. And it seems, in the beginning, to have been sun rather than rain that germinated it. In Asia, people avoid the sun with as much eagerness as Englishmen seek it out; the sun can kill, and shade is vital. A private and perambulant oasis, a mobile shade that may accompany one upon one's business in the tropical high noon, this was obviously a desirable invention—and so, in the East, men seem to have thought very early, for the umbrella is recorded in China in the 12th century B.C., and doubtless was known before that. Ever since, all over the East, the umbrella has turned its face as faithfully as the sunflower to the daily sun; but also, in the East, it has enjoyed a prestige far greater than that accorded to it in Europe. Obviously, the hotter the sun, the greater the relief afforded by the umbrella, and the more praiseworthy. Very early, the umbrella came to rank as one of the attributes of very important persons, even as a symbol of royalty itself, and it appears prominently in the titles of various princes: "the glorious and most excellent Majesty of Burma, reigning over the umbrella-wearing princes of the East", or again: "King of the White Elephants and Lord of the Twenty-Four Umbrellas".

Only a little of this splendour has clung to the European umbrella. In SS. Quattro Coronati, at Rome, there is a 13th-century painting which represents the Emperor Constantine (who had his capital of course in the

East) transferring the imperial insignia to Pope Sylvester; an umbrella is included, and has ever since played its part in the ceremonial of the Catholic Church. But generally speaking, the part it has played in pomp and pageant in Europe has been slight, and its main interest lies in its use in everyday life. As sunshade, it was known in Greece and in Rome long before Constantine; Aristophanes turned to it for one of his most vivid similes: "Your ears opened like a parasol, and then furled again". In the heat of Italy it flourished, used after the Renaissance by all smartly dressed equestrians, and there is a very gorgeous Van Dyck of the Marchesa Elena Grimaldi with a slave supporting her parasol. Thence it spreads north, and, as it does so, confronted by the execrable climate, it has to modify itself to survive; indeed, it splits—into *parasol* and *parapluie*. Rain is now a factor to be reckoned with, and, finally, the decisive factor in the survival of the umbrella.

The story of the parasol was steady and prosperous until very recently. A feminine accessory, it suffered the innumerable mutations of feminine fashion, yet remained in essence constant to itself, whether covered with silk or lace, ribbed with whalebone or with steel. But it was more than a purely defensive weapon against the ravaging sun, it was an offensive instrument of coquetry, comparable in quality with the yashmak and the fan. It had, too, other uses; one authority recommends it urgently for picnicking in the jungle: a parasol will put to flight the most persistent tiger, if opened smartly in its face. And yet, now, it is all but extinct. It flourished best in an age when women staged themselves in voluminous curves, that moved in a stately billow, yet could, in a gust of emotion, break into a million ripples of curvetting flounces. The parasol was an echo, a circumflex accent on these curves. In a drawing of George Cruikshank's—"The Crinoline Race"—or—What it must come to at last if the Ladies go on blowing themselves out as they do"—which depicts a flight of crinolined ladies suddenly airborne from the promenade on an extra-strong blast of ozone, it is obvious

The Persian Emperor Darius (right) top-hatted, with beard freshly curled, leaving his Persepolis home some 2000 years ago for a constitutional: over him goes the imperial umbrella, long reserved for royal heads throughout the too-sunny East. So, also, many centuries later, (below) the Princes of Siam, the seven-tiered umbrellas of their elephant-borne combat-teams looming up like galleons from the horizon, mass to repel the Burmese invaders, armoured with inferior five-tierers. Alas, in Europe campaigning has never been the same since Wellington forbade his officers to wear umbrellas in action



*From Robert Payne's Journey to Persia (Heinemann)
by courtesy of the author and Dr Arthur Upham Pope*



From a picture in the possession of Mrs Morris, by courtesy of Maurice Collis, Esq.



Anderson photograph, from W. F. Mansell



By courtesy of the Museo Civico Correr, Venice

When Constantine established Constantinople as capital of the Eastern Empire, in the 4th century A.D., he is said to have handed over the imperial insignia (umbrella included) to Pope Sylvester in the West. (Above) A reconstruction of the scene, at SS. Quattro Coronati in Rome, shows the umbrella in the act of being handed from East to West; it still appears in papal ceremonial, and the Doges of Venice walked under an umbrella of cloth-of gold. But the Venetians could put it to more frivolous use, as in (left) this broillic extravaganza, designed for The Triumph of China, a water pageant, by Alessandro Mauro in 1716



By courtesy of the Trustees of the National Portrait Gallery

Sir Henry Unton, a distinguished Elizabethan ambassador, had his life-story painted; this detail shows him in Oxford at his window (apparently trapped indoors, brolly-less, watching the rain), while above he rides near Padua, fashionably equipped with an umbrella against the sun. Europe did not generally adopt umbrellas against the rain till about two centuries later



Fred Teegen

The Marchesa Elena Grimaldi (opposite), painted by Van Dyck in hot Genoese sunshine about 1625, is stupendously elegant but perhaps overdressed for the climate: her umbrella is like an awning. The lady in the Bikini sunsuit (left) has gone over to the other extreme, and her parasol is clearly non-umbrageous but designed rather as a token compliment to the sun; a pupil of Rouault might have painted her last summer on the plage of Genoa. In reality, however, she is a figure from a Sicilian mosaic of the 4th century

Van Dyck's portrait of the Marchesa Elena Grimaldi is reproduced by courtesy of the National Gallery of Art, Washington, D.C. (Widener Collection)

that the parasol summarizes the whole structure of then feminine dress: the crinoline is as it were but a more intimate parasol, adapted so that it can actually be worn on the body. The advent of speed, the streamlining of fashion, helped put the parasol out of business; it can be worn in the governess-cart, but not in the Tube or a motor-car. It demanded a gentler tempo of life: leisure, and space for manoeuvre. But perhaps the revolution which really sealed its fate was the Back-to-Nature urge; women, who once thought a freckle was their undoing, now fly to the Riviera to acquire a tan.

The parasol, then, is almost dead, but the umbrella, anti-rain, continues. It had a more difficult start; it was considered effeminate, and then, in the mid-18th century, as degrading—if you were seen out with an umbrella, the inference was obvious: you owned no carriage. England accepted it later than

the Continent, and with great reluctance, though it was here that the umbrella was to find its richest breeding-ground and its most loyal following. It was eventually popularized by John Macdonald, but even his quiet courage had to endure the mockery of crowds, and he was abandoned by his sister, ashamed to be seen in his company. Once it caught, it very rapidly became a usual accessory, particularly amongst the urban middle classes. Its weight, the great drawback, was cut drastically in a series of improvements, culminating in those of the two English manufacturers, Sangster and Fox, about 1850.

It had, and still has, faithful partisans, but, compared with the parasol, only a very restrained glamour. The difference between the two is clearly indicated by comparison of two paintings: "The Visit" of 1876, by J. J. Tissot, and Ford Madox Brown's "The Last of England", finished in 1855.



Tissot's lady, sultry and feline, has a parasol of the latest elegance (a curious form, with the handle at the wrong end, which had been in favour also at the beginning of the century). The parasol is furled, but it rests in the crook of her arm with the dangerous delicacy of a shotgun. The umbrella was a different matter, an everyday affair for keeping off the rain. Madox Brown's picture shows the northern umbrella in all its raw functionalism,

extended against a wet and draughty cold. "It was painted", wrote Brown, "for the most part in the open air on dull days, and, when the flesh was being painted, on cold days." The gooseflesh begins, and sea-sickness is near; the umbrella broods over all. In the faces, which are those of emigrants looking their last on their native country, depression is perhaps more strongly marked than in the general run of faces of umbrella-carriers; depression is nevertheless the general expression. No funeral is complete without an umbrella. Such was the umbrella of the mid-Victorian, black and baggy, as worn by Mrs. Gamp, and also of formidable respectability. Towards the end of the century, however, there was some development; the male black umbrella took on two roles. The functional gamp continued, battered, living in damp carved oak stands in halls or lost in the racks of railway carriages. But there now emerged also the City umbrella, still black, but ceremonial once more. The tight, immaculate silk-clad stick; for the City gentleman, the sceptre to the bowler-hat's crown. And so it still serves, the emblem of the City man and of the pseudo-City man, such as officers of the Brigade of Guards in civilian



The 19th-century umbrella, society summer model, anti-sun—this lady, painted by Tissot in 1876, is got up to kill; her parasol's primary function is not perhaps to keep off the sun, but to allure the man (and, having allured, perhaps—to judge by the crook at the wrong end—to hold)

The 19th-century umbrella, all-the-year-round utilitarian model, anti-rain: black and uncertain of its shape—Madox Brown's couple, painted as they look back with despair at the Last of England, take their umbrella with them even though emigrating, for Englishmen find it hard to imagine a climate where it is not necessary



By courtesy of the Museum & Art Gallery Committee, Corporation of Birmingham

clothes and many members of the peerage. Some of these umbrellas last a lifetime without ever being opened—would split, indeed, at the thought of it.

Such is the position of the umbrella today. Women's umbrellas, it is true, are tending to a happy reversion to the mannered frivolity of earlier days, though they are drowned by the great preponderance of masculine black. It is curious to note however that the two paintings which, in the whole of European painting, have most splendidly exploited the formal possibilities of the umbrella, Madox Brown's, and Renoir's "Umbrellas", in the National Gallery—both of these show the usual black broolly. And it is the usual black broolly that survives over most of the world, haphazardly; American men, for instance, do not take an umbrella if they think it is going to rain. If it is actually pouring, they take one—if they happen to have one. Only in England is the umbrella part of a living cult, of the uniform of a large section of society. Except—perhaps—in Japan.

Japan is changing so fast that the umbrella may already have succumbed to Democracy.

But it remains a fact that England and Japan have promoted the most individual and stubborn breeds of umbrella. Much field-work remains to be done, and no figures are available for Japan, and one may be misled in her case by the overwhelming evidence put out by her artists, for the Japanese are the only nation who have consistently and successfully represented rain—and so, umbrellas—in their art, particularly in that of their colour-printers. One of the most famous of Hiroshige's prints, "Ohashi in a Summer Shower", is a superb example. Many Japanese umbrellas could serve both as *parasol* and *parapluie* (the English had tried a similar thing, in 1805, the *paratout*, or *en-tout-cas*, but it was condemned as too heavy for a sunshade, and too small for use against rain). But the Japanese make their umbrellas, as everything else including houses, beds and toothbrushes, from bamboo, and cover generally with paper. They are cheap, they are expendable, and seen in a landscape by Hiroshige or Hokusai, they seem inevitable, with Mount Fuji in the background to echo them, and the coolie hats, which are so light and comfortable to wear, themselves umbrellas with-



By courtesy of the Trustees of the National Gallery; and Odhams Press Ltd

The 19th-century umbrella, utilitarian model—but Parisian; the originals, thrusting up in dangerous confusion against a sudden shower, would doubtless have appeared black to ordinary eyes, but to Renoir, who painted this, nothing on earth was black

out sticks. And they serve, or did serve, a far larger section of society than the English umbrella.

But the point at issue here, a point that can only be settled by some devoted geographer, is this : why should two islands, each tacked on to the end of a great continent, have proved hotbeds of umbrellas? Both countries of course are wet; England, notoriously, always wet; Japan, wet less consistently but with a more concentrated series of rainy seasons in the summer, when the South-East monsoon from the Pacific burdens itself over the warm sea, to discharge on the spiny ridge

of the archipelago. Japanese storms can be sharp and brilliant, as you see them in Hiroshige's prints, and hence no doubt their appeal to the artists. British painters have taken but little notice of the rain, beyond propping an umbrella over their easel, and the sculptors, who might so easily have used the expanded umbrella as a far more apt, and efficient, halo over their marble figures of statesmen and benefactors, have almost entirely ignored it. But what have Japan and England in common, beside the sea, the rain and umbrellas? Why do these two particular islands breed umbrellas?

The 19th-century umbrella, Japanese model—like Britain, Japan is uncertain in climate, and the relative density of umbrellas in these two island groups is probably the highest in the world. But Japanese artists, unlike most of their British colleagues, have paid copious tribute to the umbrella in their work, as Hiroshige in this print



By courtesy of the Trustees of the British Museum

Russia before the Mongols

by MARIE NOËLE KELLY



All photographs by the author

Ektach

The cupolas of the cathedral of Novgorod and the walled kremlin, seen across the River Volkhov

Lady Kelly is the wife of Sir David Kelly, British Ambassador to Russia from 1949 to 1951, and is the author of Turkish Delights, Mirror to Russia and Picture Book of Russia (Country Life)

It is only a few years since Mr Churchill coined that epoch-making phrase "The Iron Curtain", and it will for ever be associated with Soviet Russia. But in truth the first Iron Curtain—and an even thicker one—descended on Russia in 1240 when the Mongols conquered the old Russia. It was partially lifted three centuries later by Ivan the Terrible, and lifted higher still by Peter the Great; but the Mongols had, once for all, separated the Russians from the rest of Europe.

To understand the mediaeval pre-Mongol

cities of Russia one must answer the question, who were these mediaeval Russians? Within the limits of a single article, one can only describe them very simply, leaving out all the historian's reserves and qualifications. They were Slavs from Poland, who turned eastward when they found their way southward blocked by the Byzantine Empire. A nomadic people of merchants and agriculturalists, they set up a chain of trading settlements, of which Novgorod was at first the chief, on the river-route from Scandinavia down to Byzantium (Con-



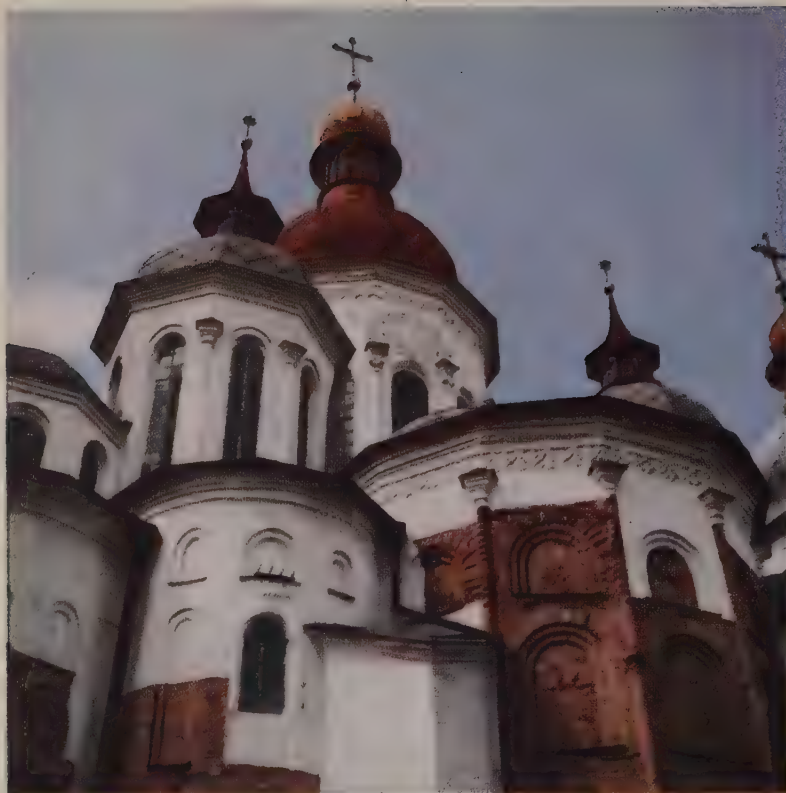
Ektachrome

Santa Sophia of Novgorod. The stone church built by Greek architects in 1045 replaced a wooden structure. It was restored in 1570, 1611, 1893 and 1949. The fresco dates from the 17th century

stantinople). This was the route of the Volkhov, the Dvina, the Niemen, and the Dnieper. The more easterly one—the Volga—was blocked by warlike Asiatics, and further south by the Arabs.

In the 9th century the Slavs of Novgorod invited the Vikings (the Varangians, called Russians by the Finns) under the legendary Rurik to be their leaders—perhaps as the Britons invited the Anglo-Saxons—but it was the Slavs who absorbed the Varangian-Russians in a few generations. Under the leadership of Rurik's successors, Oleg and his son Igor, the Russians penetrated in the 10th century to the neighbourhood of Byzantium.

In the first half of the century they concluded several commercial treaties which, amongst other facilities, allotted special quarters in the suburbs of the city to the Russian traders. The treaty made in 945 was to last "as long as the sun shines and the world exists"; and although this did not prevent subsequent hostilities between them, in sober fact the Russian-Slavs received from Byzantium the one permanent institution in Russian history, the Orthodox Greek Church. For it was the Greek Church which saved the Russians from being for ever a Mongol colony, and today again it is Russia's one spiritual link with the West. From this period until the coming of the Mongols the



Ektachrome

Of the 11th-century church three apses remain intact; some of the original brick, as here seen on the main apse, has been uncovered by the Soviet authorities during recent restoration to show its texture. The church has fifteen Baroque cupolas which date from an earlier restoration. Greyish painted tin has replaced the gold leaf which formerly covered them

Santa Sophia of Kiev, built by Grand Prince Yaroslav between 1030 and 1037 to commemorate his victory over the Pechenegs. Its plan is rectangular with one principal nave flanked by eight small ones. The cleaning of the frescoes undertaken since 1935 has now revealed, on the arches of the central nave, the medallions which depict Yaroslav's wife Irina and their three daughters. These all married kings—those of Norway, Hungary and France



chief city of Russia was Kiev, which Igor's grandson Vladimir, who established himself there in 980, transformed into a powerful principality with many institutions resembling those of Byzantium, himself becoming converted to Christianity and marrying the Byzantine Emperor's sister.

If Kiev was monarchic, Novgorod developed into a republic of Northern traders, closely resembling the Hanseatic cities of the Baltic; and both centres, together with such cities as Smolensk and Chernigov which linked them on the north-south waterways, were in close cultural contact with the West. To them were added later the eastward colonies, towards the Volga, of Suzdal, Rostov, Vladimir and Yaroslavl. These trading cities had certain great weaknesses which led to their inability to resist the Mongol hordes. They had no natural barriers eastwards against the Asiatic tribes — Khazars, Pechenegs, Polovtsians (Cumans) and so on—and were worn out resisting their constant incursions. They were commercial cities without seaports or harbours. Worst of all, they had no system of direct hereditary succession; the succession passed to the eldest, and the others received their own little principalities; consequently they remained a loose federation of warring princes. In 1169 Andrew Bogoliubsky, Prince of Vladimir-Suzdal, was able to organize a coalition of eleven princes against Kiev, which they sacked and fatally weakened.

So these Slav-Scandinavian merchants who had so much in common with Europe failed to build a Russian state; this was the eventual legacy of the Mongols, but when it came it was built on serfdom, Asiatic autocracy, and the central despotism of Moscow; and even the Russians' Slav blood had been inextricably infiltrated with that of the Mongols. Russia came back into European history as a semi-Orientalized state which shared little of the Western European background, with the exception that it remained Christian in its own fashion; and though therefore Stalin's "Two Camps" were already a permanent reality, the rulers of Russia have ever since, if by fits and starts, desired to have a foot in each camp.

When I came to Moscow with my husband in 1949, the Soviet Government had closed the curtain on most of the industrial areas, the Baltic (except Leningrad) and the Black Sea (except Odessa); but they did not bother about the old cities of pre-Mongol Russia: Novgorod, Pskov, Vladimir, Suzdal, Uglich, Murom, Rostov-Yaroslavsky. Consequently we were able to visit them all, and when it became clear to the authorities that we really

were thrilled by these monuments of Russia's past, we were allowed to visit Kiev itself, forbidden city to diplomats for a number of years.

Of course we did not confine our interest to the relics of pre-Mongol Russia. Building in the Russo-Byzantine tradition was pursued by the Tsars of Moscow throughout the 16th and 17th centuries, and then came the great epoch of Westernization inaugurated by Peter the Great, of which the greatest monument is St Petersburg (now Leningrad) itself, a splendid Classical city planned through a century by the Tsars and their Westernized aristocracy with a succession of able Western architects —Guarengi, Rastrelli, de Thonon. I would gladly linger over the graces of St Petersburg, with its canals lined with mellow aristocratic palaces, its noble river dominated by the 18th-century Winter Palace and Admiralty on one side, its Russian fortress of St Peter and Paul on the other: the Palaces outside the city, Peterhof of the terraces and cascades, Tsarskoe Selo with its beautiful park, its elegant Cameron gallery, its Chinese village and lakes. I have however taken as my subject the Byzantine influences absorbed by the Russian trading city-states of the 10th and 11th centuries and preserved throughout the Mongol domination—Byzantine influences which, starting naturally at Kiev in the south, were carried northwards to Novgorod, Pskov, Vladimir and Suzdal.

These Byzantine influences are most evident in the churches, the enamels, the icons—Russia's great traditional art—and the clothing worn by the princes, the nobility and the priests, for the stiff hieratic vestments of the Byzantine Court and clergy were both an outstanding feature and an essential symbol of Byzantine civilization.

The typical Russian church is a square building with five onion-shaped bulbous cupolas, in honour of our Lord and the four Evangelists. Often there are subsidiary cupolas, or towers decorated with imitations of the *kakochnik*—the Bride's head-dress. Inside, the great feature—a purely Byzantine one—is the Iconostasis, the screen from floor to ceiling which hides the altar and the priest, except through the door in the middle, from the congregation, who invariably stand. The Iconostasis, like the walls of the church, is covered with icons—the sacred pictures. These icons were invested with a holy character quite different from that given to statues in Western Christianity. They were all potentially miracle-workers; so the artist was expected to adhere closely to tradition, to think only of his subject: to experiment in

new techniques or new interpretations was sacrilegious. It is curious that this did not prevent the attainment of high artistic beauty; within the limits laid down by religious convention it reached its peak in the 14th century with Rublev, whose "Trinity" is one of the masterpieces of Russian art.

In a fascinating paper read before the Royal Historical Society in January 1946, Professor Dvornik gives many illustrations of the cultural links between those early Slav-Scandinavian Russians and the West, especially through the Czechs of Bohemia; there are frequent references to Russia in early French literature; there was an extensive commercial interchange, especially through the Baltic; and in Kiev, people prayed to the saints of our old Saxon churches: Magnus, Olaf, Botolf; to the Roman Popes Clement and Leo; to Adalbert and "Good King Wenceslas". Vladimir became the brother-in-law of the German Emperor Otto II; his descendants married King Harald of Norway, King Andrew of Hungary, King Henry I of France and Gytha the daughter of Harold, the last Saxon King of England. The "Instruction to my Children" written at the age of seventy-two by this Englishwoman's husband, Vladimir Monomakh, Grand Prince of Kiev from 1113 to 1125, gives a more vivid picture of life and thought in that far-off Russia than any description or analysis, as the following quotations will show:

Idleness is the mother of all vices: guard yourselves against it. May sunrise never find you abed! Go early to church and lay your prayer before God; thus did my father, thus do all decent people. With the first rays of the sun, your ancestors praised God joyfully; then they discussed business with their Council, or dealt justice to the people, or set forth to the chase . . . I attended personally to the affairs of the Church and the observance of religious rites, while not neglecting the order of the household, the stables, the kennel and the hawks.

Twenty-three campaigns have I made; as for little expeditions, I cannot recall their number. With the Polovtsians alone I concluded nineteen treaties of peace . . . Who travelled more swiftly than I? Leaving Chernigov early in the morning I reached my father's house at Kiev before Vespers. How often did your grandfather and I confront wild beasts in the chase! Twice the wild ox threw me into the air with his horns; the great stag has struck me with his antlers; the elk has trodden me underfoot; and once a bear got his teeth into my saddle—the fierce beast rushed upon me and overthrew my horse . . . In my youth I took no care to preserve my life; but God preserved me.

And you, my children, fear neither battle nor

beast, but face all things with courage; you are in God's hands and his care is better than man's . . . It is not fasting nor the solitude of a monastery that will procure eternal life, but only doing good . . . Swear not by God vainly; but once having sworn, keep your promise . . . Above all, pay respect to the stranger that is your guest, be he mighty or weak, merchant or ambassador; for upon the treatment which people receive in a country depends its good or evil reputation in their own . . .

But if it was the Mongol invasion which rang down the Iron Curtain, it remains true that the drift or tendency was away from the West, even from the Slav brothers in Poland and Bohemia, ever since the acceptance in the 10th century of Christianity in its Greek form from Byzantium. The modern Englishman has come to regard religion as one of various cultural activities which the individual is free to adopt if he feels that way, but which is essentially secondary to his main political and economic interests and is merely his private concern. In the 10th century—as for long afterwards in Europe, and to this day in Asia—religion involved the whole culture and way of life; and in adopting Byzantine religion, the Russian Slavs adopted with it a slightly modified form of the Greek alphabet, Byzantine art, and the Byzantine way of life, thus embarking on a completely divergent social and mental evolution.

Even if the Mongol invasion had been successfully resisted Russia would have had no part in Gothic architecture and the feudal concepts of chivalry, or later the whole Renaissance with all its implications. The Mongol (Tartar) occupation, however, carried the separation a long step further, and imposed on the Russo-Byzantine society an Asiatic stamp which so intensified the separation that the Westernization by Peter the Great and his successors only resulted in creating a profound cleavage between the Westernized governing classes and the mass of the people. The latter, reduced to a peculiarly degraded form of serfdom during and after the period of Mongol domination, were never able to catch up with the artificial Western culture forcibly introduced by the Tsars.

Most of the great churches of the Kiev of St Vladimir and his son Yaroslav, who so greatly beautified the city, have perished, and Santa Sophia, a ruin in the 17th century, has suffered grievously in the Baroque restorations of that, and the following, century. Russian scholars have claimed that the original cathedral owed more to Georgian than Byzantine inspiration, but without being an

expert, no-one with artistic feeling who has visited the most ancient churches of Georgia can have the least doubt that the mosaics and frescoes of Santa Sophia in Kiev are purely Byzantine in technique, style and subject matter.

Entering Santa Sophia in Constantinople the building itself in its own right, so to speak, overwhelms one with the majesty of its conception. To me the dome is all, and nothing detracts from its splendour and its breath-taking proportions. The mosaics are fine but they are in a way independent of the church itself. Not so at Santa Sophia in Kiev where there is none of the awesome simplicity of the

great church. Its plan is different as eight subsidiary naves flank the principal one and there are too many pillars. But as the door was opened to us by an enthusiastic attendant, the praying Virgin, colossal in its proportions, faced us from the "Indestructible Wall". Owing to a trick of light and the slight curve of the arch she seemed to unbend from her static immutability and receive us. This is no Lady of Tenderness but the symbol of the Terrestrial Church; and the name "Indestructible Wall" is said to be an allusion to the miraculous Virgin of Byzantium—Our Lady of Blachernae—who protected the walls of that city. She is garbed in a long blue robe





All monochrome photographs from Marie Noële Kelly's Mirror to Russia (Country Life Ltd)

Beneath the fresco at Novgorod depicted on page 401 are the 12th-century bronze gates made by German craftsmen and assembled by Master Abraham, who appears carrying his tools between the lower panels of the section here shown. The upper left-hand panel portrays Pharaoh driving his chariot

(*khiton*) covered by a purple veil. This in turn is embroidered with three white crosses, one on the forehead, the other two on the shoulders. Her feet are enclosed in purple sandals and she stands on a platform similar to that used by the Emperors when they received in state in Byzantium.

It is at Kiev, and in this church, that representation of the cycle of the Madonna started in Russia for the first time; this theme is treated with elegance, but too much restoration has, at all times and particularly since the 18th century, deprived these mosaics of the marvellous patina which their first cousins (likewise of the 11th century) at Daphne in Greece have retained.

In the summer of 1951, when I visited Kiev, official restorers were busy cleaning the frescoes of the rest of the church and doing it very well. Thick coats of grime are being removed and on the arches of the central nave,

facing each other, Yaroslav and his sons stare at Queen Irina and her daughters Elizabeth, Anastasia and Anna (the latter Queen of France), respectively their wife and sisters. They are represented in true Byzantine style with sharp eager faces, deep-set eyes under arched eyebrows. These are the most celebrated restorations but a number of saints, for example a fiery St Paul, are emerging in pristine freshness. The extraordinary hunting scenes and cavalcade in barbaric costumes chasing the wild beasts in the Hippodrome at Byzantium, which decorate the stairs and passages leading from the church to the royal apartments and are unique in *genre*, are badly deteriorating as compared to the newly uncovered frescoes in the church proper. This is of course a museum now and not used for worship.

The exterior of the church has been shorn of many ugly excrescences and some of the

Byzantine brick uncovered to show its texture. The Baroque cupolas, golden no more, but covered with greyish painted tin, are illogical, but seem likely to remain.

In the collection of buildings forming the famous 11th-century monastery (Lavra), the main church of which has been reduced to a heap of rubble in the late war, the chief interest is in the catacombs where a thousand pilgrims (at least many of them still are) visit daily the naturally mummified bodies of some scores of hermits who lived and died in the little grottoes off the labyrinth of low narrow tunnels eight and nine centuries ago. The regime had stopped it all during the war ("*De par le Roy, défense à Dieu de faire miracle en ce lieu!*") but the Germans for their own purposes brought the monks back and reopened the catacombs; and now the rare visitor from the West follows, taper in hand, the guiding monk, and hears through partitioning walls the sad Slavonic chant of the pilgrims crowding some chapel tomb nearby.

Far to the north lies Novgorod "the Great", capital of the first Russians before Kiev, which survived Kiev and Vladimir when these fell to the Mongols, maintaining a precarious existence until, after their retreat, Moscow emerged as the new Grand Ducal, then Tsarist, capital of Holy Russia: Moscow, "the Third Rome". Kiev was essentially a Byzantine city in its culture and commerce; Novgorod was essentially a trading emporium, the link between the Hansa towns of the Baltic and Byzantium. Kiev was the city of St Vladimir and Yaroslav, a royal city, reflection of the Byzantine Imperial capital; Novgorod developed into a Republican city-state, a colony of merchant adventurers, bestriding the great north-south trade route with sword in one hand and a pair of scales in the other. So were Pskov, Smolensk, Rostov-Yaroslavsky, Suzdal and the others; but the greatest of these was Novgorod. For Novgorod on the Volkhov was linked by water with the Gulf of Finland through Lake Ladoga, with the Gulf of Riga by Lake Ilmen and the Dvina, with Kiev and the Black Sea by the Dnieper, with the Caspian by the Volga.

Mountains, hills and valleys which have meant so much to us Western Europeans mean little to the Russians. Their imagination has always been haunted by the great plains and the slow rivers. A best-seller since the Revolution is *And Quiet Flows the Don* and the most popular song before 1918 was the "Chant of the Volga Boatmen"; the greatest hero of the mediaeval *byliny*, the Russian equivalent of the *Chansons de Geste* and the *Nibelungen-*

lieder, was Sadko the merchant, who made a corner in the market of Novgorod by his bet that the fish with the golden fins would be found in Lake Ilmen; Sadko who, having leaped into the sea to calm the storm, made the sea-god dance to his harp and so started the storm going again.

Of all the operas I saw in Moscow and Leningrad *Sadko* was the one in which I felt most strongly the vibration of the audience in tune with the actors; a veritable psychic current emanated from the robed and befurred merchants drinking in the palace, from the multi-coloured crowd in the gay market place on the river-front, from the troops of buffoons posturing in the traditional grotesque dances with a verve and joy in movement unknown on the modern Western stage, from the Indian prince stepping off his ship to sing his famous love-lyric.

Just as *The Bronze Horseman* (the new Soviet ballet) reflects the adoration of Peter the Great and his unruly slave the Neva, and *Swan Lake* (a classical ballet) incarnates the highest poetry in the popular soul, so *Sadko* rouses all the latent sympathy, surviving the centuries of Byzantine formalism, Tartar slavery and Petrine Germanism and Gallicism, with the gay colourful barbarism of the early Slavs.

The great city-state of Novgorod continued until the 15th century to control through its colonies and vassal cities (among which Pskov itself was included until 1348) a vast area stretching right across Northern Russia from the Baltic to the Ural mines. The buildings which issued from all this wealth and power from the 11th to the 16th century are technically inferior to those of Kiev and even Vladimir, a colony of Kiev, but are of greater interest to the student of Russia; for the men of Novgorod, in accepting the Byzantine religion and with it Byzantine art, adapted it to their own typically Russian conditions. Vladimir and Suzdal are on the whole throwbacks to Armenia and Georgia: they are of Kama stone and often covered with exterior sculptures. The palaces and basilicas of Imperial Byzantium were out of place in a republic of merchants; the wider bay windows and Byzantine cupolas suitable to the Mediterranean were out of place in a climate where rain in the summer and snow through the long winters were the ordinary background of life. So the churches become smaller and lower, the windows become mere slits, the flattened semi-spherical cupolas are transformed into the onion-bulb domes destined to become the most prominent characteristic of



An eastward colony of Kiev, towards the Volga, Vladimir became the capital of the principality ruled by Andrew Bogoliubsky. The cathedral of the Assumption (above) was begun by him in 1156. A few miles away the exquisite church of the Intercession (below), also of the 12th century, reveals Eastern influences



The church of St Demetrius in Vladimir was built by Andrew's brother Vsevolod. Features derived from Georgia and other Oriental sources enter into the simple architecture of these 12th-century churches of white stone quarried in the Urals. Figures of legendary beasts on the tympana also designate Vladimir as a meeting-place of Eastern and Western elements

all Russian churches until the later introduction of the alternative pyramid form. (These developments occurred over a longish period, extending beyond that with which the present article is mainly concerned, and are therefore not evident in the particular photographs which have been chosen to illustrate it.)

Kiev's Santa Sophia is half the size of Byzantium's; but Novgorod's is smaller still. Here no Baroque cupola as at Kiev detracts from the pure and long lines. The cathedral was heavily damaged by the Germans in the 1940s but it has been completely restored as a museum, and its chalky walls, faintly bluish through their very dead whiteness, emerging from the coral necklace of the kremlin walls form a unique if diminutive tableau. Seen across the River Volkhov which flows slowly at the foot of these mediaeval battlements, the church and its bell-tower are reflected in the imperceptible flow. This tableau is unique because the largest of the domes is painted gold, a pale greenish gold amongst the grey ones. All these cold tones are most satisfying under the low, stretching sky.

In Novgorod's cathedral there are three apses compared with Kiev's five; the columns are of stone instead of Kiev's marble. Instead of mosaics there are frescoes. They were painted first in 1144 but have been heavily restored. To find unrestored ones of that date the visitor must bump, as we did, on a dirt-track five miles out of Pskov and visit the church of Our Lady's Nativity in the Snetogorsky monastery (the church of the Thousand and One Hundred Frescoes) which is full of unrestored frescoes of the 11th and 12th centuries. On the west face of Novgorod's Santa Sophia a great 17th-century



fresco divided into three panels covers the whole of a slightly recessed outside wall. It is heavily repainted but striking nevertheless, and under it the stupendous bronze doors called the "Kherson" gates are a striking illustration of Novgorod's intimate contact with German civilization, for the numerous figures which fill its panels are the work of Magdeburg craftsmen in the best mediaeval German tradition.

One general conclusion is clear: if the foundation of Russian architecture was Byzantine, its development was deeply affected by local and Asiatic influences; just as Peter's Westernizing ended in the unique hybrid of the 19th-century Tsardom, and just as Marxism on Russian soil and directed by the Georgian Stalin has turned into something very different from what its author intended.



The postman's first call is up a steep hill to his daughter's house—to collect his milk. But his ten-hour day takes him much further afield over the snow-covered Tyrolese landscape

Tyrolese Snow Village

Notes and Photographs by GERTI DEUTSCH

To reach Alpbach you have to squeeze onto an overcrowded bus at the little town of Brixlegg near Innsbruck and travel for an hour or so up a steep, winding road. When the road ends you have arrived. Round the Baroque church huddles an asymmetric cluster of old Tyrolese houses, some of them dating back to the 17th century. Beyond it lie, far apart, the spacious farms—the Bauernhöfe or Erbhöfe—that have been handed down from generation to generation. Here work has been going on for centuries in a slow, regular rhythm, varied only by the changing seasons. The Tyrolese farmer has learnt how to get the best out of his mountainous land; and agriculture flourishes. Stock-keeping is his main interest: the local breeds are renowned. But the alpine pasturing of animals in summer and their winter maintenance requires more going to and fro than farmers elsewhere would relish.

Mountains, indeed, multiply distance. Alpbach, for example, is barely five miles in a straight line from the valley of the Inn; nevertheless it is difficult not to feel a sense of isolation which even the seasonal flood of tourists does little to alleviate. Thus the postman serves as a principal link in the life of the local inhabitants. On foot he covers a prodigious round, delivering two kinds of news: that in his letters, and the probably more interesting sort which keeps the scattered farms up-to-date on the doings of the neighbourhood. One should not be misled by the informal dress of the postman portrayed opposite; he wears it only for his morning milk-call and always does his round suitably clad in uniform and cap. Austrian postmen are talented fellows, as you will find if you meet the Band of the Innsbruck Postmen making one of its triumphant tours of the Tyrol

(Below) Morning visitors scour the village streets in search of skim or buttermilk for breakfast





(Left) The day begins early on the farms. Long before dawn children are dressing for school. Peterle, not yet of school age, has trouble with his trousers.

(Below) Father has finished milking the cows and enjoys his breakfast. Almost everything in the warm, friendly kitchen is made of pine-wood; and the same quiet harmony pervades the people as their belongings. In the Volkskundemuseum at Innsbruck the wood-carvings show how deeply engrained in the Tyrolese is a sense of perfect proportion and how often this, with their skill in the craft, produces a masterpiece



(Right) Wood is seldom out of mind, from the time the trees are felled till the snow melts and trunks are floated down the Alpbach. This wild stream, cutting ever deeper into its bed, makes the path to the village along it an awkward one. When he has afternoon school—there are not enough classrooms for all to have lessons every morning—Hansel the eldest boy chops wood for storage as fuel. (Below) Still not fully awake, the children set off for school. They are lucky, with only half-an-hour to go and a good path. Other children have to leave in the dark and ski for miles





These children find school-life great fun. There are two teachers: a young woman for the smallest and a man for the older children. The atmosphere is a friendly and easy one



(Above) *The standards seem well adjusted to the pupils' capacities. But not all school activities take place indoors for often ski-ing expeditions are arranged and during Carnival time the children dress up and join in many kinds of games.*

(Right) *They are quiet as mice up to about midday; but when the bell rings there is a regular explosion. Slippers are kicked off and coats are snatched down from the pegs. Satchels that just would not fit first thing in the morning fit with miraculous ease now. Then laughing and shouting they rush pell-mell down the stairs into the sunshine and snow, an avalanche of merriment*





At home, the housewives are busy. (Above) Washing takes place every month or so in a special Waschküche near the house. Clothes are hung round the balconies: they freeze almost at once but soon dry in the sun. (Below) Baking, too, is done in an outside oven: loaves, carried through the snow, are inserted with poles





On a fine evening the children enjoy themselves ski-ing in the snow. But for grown-ups work continues at its quiet pace in stable and kitchen until sunset; by nine everybody is in bed

Saba: the Island with a Jeep

by WILLEM VAN DE POLL

At the entrance to the mouth of the Orinoco river where, in the eastern part of Venezuela, it flows into the Atlantic, begins a chain of small islands. They are mostly of volcanic origin and are regarded as a part of the South American continent. On the map they look like a string of beads which curves first in a northern and then in a western direction, circling the Caribbean Sea.

The history of these islands, from Trinidad to Cuba, is a proof of the great importance which they have had since the time of Columbus as natural bases for sea routes from north to south and from west to east. The islands passed from the hands of the Spaniards into those of the famous navigators and buccaneers, the notorious adventurers who for themselves or their great patrons obtained possession of them and used them as operational bases and hide-outs for their forays along the rich and prized South American coast.

Three of these small islands, St Martin (half-French), St Eustace and Saba, are Dutch. They form part of the Leeward Islands and even today retain traces of fluctuating periods of past foreign domination. White-skinned people still preponderate here in contrast to the populations of most of the other islands, which are mainly coloured.

Saba was colonized in the middle of the

17th century from the then British-governed St Eustace. A number of families of colonists, tired of the insecurity of the Golden Rock, as St Eustace was called, were prepared to put up with Saba's hospitality without actually yearning for it. There they busied themselves with the building of sailing-boats both for local and for ocean navigation; these boats are even today the best in the Caribbean. The predominantly English background survives not only in the names of the Sabanese but also in their language: their children are taught in English at school and instruction in Dutch, though available, is not compulsory.

St Martin may be reached by Royal Dutch Airlines from Curaçao. The traveller for Saba leaves St Martin aboard a small Caribbean yawl, the *Blue Peter*, which makes a round trip twice a week to Saba, St Eustace and St Kitts. From the small beach behind the official residence on St Martin, where they offered me a good night's hospitality, I saw this graceful boat dropping her anchor in the bay. It was still dark when I went with my luggage to the quay where a sailor from the *Blue Peter* had come to fetch me in a dinghy. The other passengers, mainly women and children, were returning to Saba and St Eustace from visits to relations on St Martin and the surrounding French islands.

Quite a time elapsed before everyone was aboard; there we were welcomed by Captain Hodge and his men Nasha, George and Marcel, who regarded with imperturbable calm the ever-growing number of cardboard boxes, travelling bags and cases coming aboard.

Dark-skinned children in stiffly-ironed cotton dresses with bright ribbons tied on their pig-tails clutched comic-looking dolls in their chubby arms. With eyes full of awe they followed every movement of their agitated mothers as they tried to prevent sea-sickness with huge handkerchiefs drenched in eau-de-Cologne. After the luggage had been counted for the tenth time everything seemed correct and the whole company disappeared down a dangerous little



A. J. Thornton



All photographs from The Netherlands West Indies by Willem van de Poll (W. van Hoeve Ltd.)

The Blue Peter approaches Saba. Captain Hodge is a perfect example of the fast-disappearing class of sailing skipper; not a single rope-end out of place misses his sharp eye. Of English origin, his family has lived for generations on St Martin



*The first duty when Blue Peter arrives is to collect the mail.
The Sabanese are intrepid seamen and handle small boats with
great skill in the breakers that beat on Saba's rocky shore*



Two Sabanese sailors. The sea-faring tradition of the islanders dates from the 17th century but they are equally at home in steamships. In addition they build the best boats in the Caribbean



Until recently the only approach from the shore to the principal village which is called The Bottom, a thousand feet higher, was by way of The Ladder, a flight of stone steps cut in solid rock

Now, however, a concrete road has replaced the tiring Ladder and the climb can be made in a second-hand jeep, Saba's only motor vehicle, which is available to prominent islanders and visitors

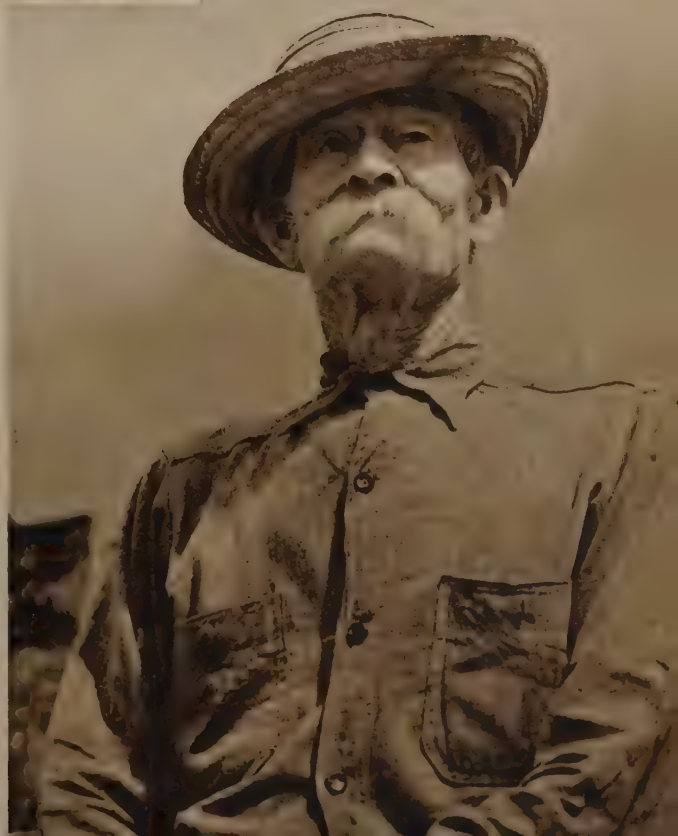






Most of Saba's inhabitants are of English stock and English is the language principally spoken. White-skinned people preponderate and have not intermarried with the Negroes but are closely related among themselves. Thus (left) the old lady working at her "Spanish embroidery" and (below) this representative of forgotten colonists both bear the common local name Hassell

(Opposite) Clambering along the steep paths that wind about Saba's rugged mountainsides one comes across groups of wooden houses perched amid the rocks. To compensate for their isolation and inaccessibility these "villages" have a delightful setting of sub-tropical flower-gardens, with distant glimpses of the blue Caribbean far below





The Bottom, Saba's administrative centre, lies in the crater of an extinct volcano at the top of the island's only road

flight of steps into the stuffy space that was to hold them for the whole voyage. Meanwhile Hodge and his crew weighed anchor and the *Blue Peter* moved into a fresh morning breeze, turning her slender bows seawards. It was still a little misty but Saba's sharp, pointed silhouette was already in sight twenty-five miles away.

Four hours later we reached the inhospitable north end of Saba and had to sail round to the west to reach Fort Bay, the only usable landing-place, on the south coast. From the distance the coast is grey; closer it becomes more coloured and greener than you might have expected though the chief colour is one between dark reddish-brown and purply-blue streaked by black rocks and deep ravines which plunge straight into the sea and disappear into the water.

There is no movement to indicate the presence of a human being; only very high up to the left are some small white dots, houses which seem like objects suspended on a wall, heaven knows how. A little later we passed the old landing-stage of Ladder Bay, aptly named because of a flight of steps more than 700 feet high that climbs the stone cliff. Then Fort Bay came into view, which is now used as the official landing-place, a small, stony, sloping beach from which a zig-zag path leads to a concrete platform. Outlined against the rocks stands a yellow building in which, when necessary, police and customs formalities are carried out. On the beach a few rowing boats lay on their sides and there was a scurry of people each one of whom was in some way or other concerned with the arrival of the *Blue Peter*—always an event in Saba. Under foresail alone we moved to within 200 yards of the shore and then on a signal from Hodge the *Blue Peter* came about and the anchor rattled out.

"That's that," said Hodge, satisfied, scratching his head, and disembarkation began. This is not so easy because huge breakers separate the ship from the beach. A small boat had already been sent from shore and dark-skinned Sabanese were struggling to get it through the breakers. They'd done it before often enough, for the Sabanese are seamen with a fine reputation all over the world.

As a rule the mail is taken off first and then it is the turn of the women and children. I was very curious to see how these big fellows would carry out this difficult and responsible manoeuvre. The way they row with their strong bodies reminds me of those other born watermen, the bush Negroes of Surinam, who

come romping through the most dangerous rapids and waterfalls of rivers in their long and easily upset tree-trunk boats: the Sabanese display the same instinct, the same matchless skill. Occasionally they make a mistake which means wet clothes and a few injuries. But with all those women and children it was quite different and I was really glad when the boat finally arrived, with its contents, at full speed on the beach. This is the only way to land on Saba.

It was my turn last and the police sergeant who was to be my guide came to greet me on behalf of the doctor, who is the acting Commissioner in charge of the island. I had taken every precaution to protect my camera against any mishap in the water and I was pleased to be standing half-an-hour later on the beach only slightly wet.

There, even the post office was represented in the person of a robust Sabanese woman and two sleepy donkeys who as soon as they feel the mailbags on their backs start to climb of their own accord.

While I was waiting for my luggage to be brought ashore I took the opportunity of having a look round on the higher concrete platform. The other passengers had already started to make the difficult climb—with their baggage carried on the heads of porters—up the concrete road to "The Bottom", a thousand feet higher.

This road is a great improvement by comparison with the old slippery, slowly ascending path which until a few years ago was the only connection between Fort Bay and the small village situated at the bottom of an old volcanic crater from which it got its name. The road goes along a rocky ravine which was the outlet for the lava flowing towards the sea in the days when Saba's volcano was still active. On Saba there is not even a tiny bit of level road, but the Sabanese are so used to this state of affairs that they have completely adapted their lives and needs to it. The police, the doctor, the priest and perhaps some others who can allow themselves the luxury keep a little horse or donkey but the rest of the population mount or descend on foot as long as the state of their health and, especially, their hearts permit it. They carry loads weighing up to 200 lb. balanced on their heads for long distances. After the completion of the concrete road the authorities then in charge had the brilliant idea of importing a second-hand jeep for the convenience of prominent inhabitants and guests going between Fort Bay and The Bottom.

This vehicle was kindly lent to me.

The journey in the jeep was not unexciting: the handbrake had long ceased to function and even in low gear the steep slopes seemed too much for the groaning little engine. The Bottom, built at the foot of the high walls of the old crater, seemed, with its collection of pretty wooden houses set in the middle of green and flowered rock-gardens, a pleasant surprise after a trip through the wild landscape. Roses and other brightly coloured flowers climbed over the loose stone walls. Tiny humming-birds flew busily from plant to plant, hovering for seconds with invisibly beating wings in front of luxuriant bunches of blossoms. In many gardens I discovered stone tombs which gave evidence of an ancient Sabanese custom of burying the dead in their own grounds. The origin of this privilege lies in the hard soil and the difficulties of transport.

The story of these people is a remarkable one. The number of inhabitants is decreasing slowly but surely; at the moment it is about a thousand and that mostly children and elderly people. There seem to be very few young men for Saba does not offer them much of an opportunity for earning a living and since they have a good reputation as sailors they leave the island very young. The large development of the oil plants in Curaçao and Aruba has also attracted many; there they earn good wages and can maintain their families at home with the money.

Since there is no opportunity for agriculture on Saba there was no need to import Negro slaves in the past. This explains the small percentage of coloured people, with whom the white population has never mixed. The inhospitality of the island coupled with its complete isolation attracted few colonists. As a result the present population shows noticeable traces of disastrous intermarriages. In one small village, difficult of access, lived some eight families all with the name Sagor, which suffered complete degeneration so that in 1933 the government decided to evacuate the community to The Bottom where they now continue to live together again on land given to them, to which they in turn gave the idealistic name of the "Promised Land".

In one way or the other all Sabanese families are related and thus one often comes across the names Hassell, Sagor (or Zagor) and Johnson. For reasons already mentioned there are too many women on the island. Young and old they pass their time doing what they call "Spanish embroidery" on linen and so provide for themselves a welcome

source of income.

The visitor who does not mind exertion and who has no fear of heights will find in Saba's rugged and varying scenery a great deal of beauty. Steep mountain paths in which big terrace-shaped steps have been hewn lead along deep clefts and ravines past perpendicular walls of rock from which large pieces often fall. The most sensible thing to do is to leave the search for the best paths to the tough little horses even if it is not easy to surrender oneself to these rocking quadrupeds which show a peculiar preference for the outermost edges of precipices.

So I went on under the care and guidance of the policeman and his two dark-skinned squires, Freddy and Hubert, who preferred to go all the way barefoot. We went to the little hamlet of St Johns where an American engineer lives, like a modern hermit, at the radio station of Pan American Airways. On another occasion our destination was a village called Windwardside. The horses took us there slowly up the slopes of the old crater, from which one can enjoy a delightful view across The Bottom to the ocean beyond. Higher up we climbed narrow paths where it is worth while to stop now and then to gaze between the rocks into the coloured depths of the ravines. Most of these precipitous formations are completely impassable and lose themselves in unseen multi-coloured depths of red, brown and green. It is only occasionally that one glimpses the sea, shimmering silver in the sun with foaming white waves beating against the rocks. Windwardside is a group of houses built on terraces joined by a number of steep ramp-like streets. In many doorways and on the steps leading to pretty flower-gardens young women and old work, chattering, on their embroidery, which they are pleased to show and sell.

A journey which has even more surprises because of the scenery is the one to Hell's Gate, situated on the north coast: it is justly named. Here I saw toddlers hardly able to walk pattering about the gardens of the houses that adhere to the rocky slope. The borders of the gardens are on the edge of fathomlessly deep clefts and are for the toddlers the limit of their little world. Unaware of any danger they jump about happily playing with balls. The policeman who noticed that my heart was sometimes in my mouth reassured me with a smile. "They are used to it," he said. "Anyway, do you consider your overcrowded streets less dangerous?"

Indeed danger is relative.

Kon-Tiki's Ancestors

by THOR HEYERDAHL

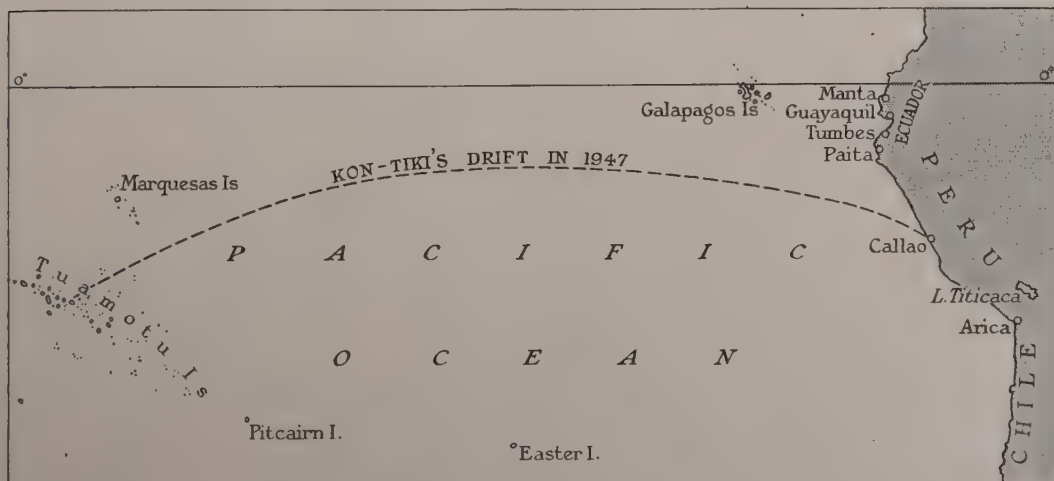
*The following account of the evidence regarding the construction and navigation of ancient Peruvian balsa rafts, on which he based the design of Kon-Tiki, is largely taken from two of the papers read by Mr Heyerdahl to the International Congress of Americanists at Cambridge in 1952. Many further details are given in his book *American Indians in the Pacific* (Allen and Unwin)*

ABORIGINAL navigation in Peru and adjoining sections of north-western South America was based on boat-building principles entirely different from those on which our own civilization based its maritime evolution. To the European mind the only seaworthy vessel is one made buoyant by a watertight, air-filled hull big enough to be beyond reach of the waves. To the ancient Peruvians the only seaworthy craft was one which could never be filled with water because its open construction gave no space in which to retain the invading seas, which washed through. Their object was thus achieved by building exceedingly buoyant, raft-like vessels of balsa or other very light wood, or of bundles of reeds or canes lashed together in boat fashion, or by making pontoons of inflated seal-skins carrying a soft deck. Such craft tend to appear primitive, incommodious and unsafe to anyone who is unfamiliar with their qualities at sea, and this may be the reason for the widespread assumption that the peoples of ancient Peru were without seagoing craft or capable sailors, in spite of their 2000-mile coastline and their outstanding cultural level in nearly all other respects.

When Francisco Pizarro left the Panama Isthmus in 1526 on his second voyage of discovery down the Pacific coast of South America, his expedition encountered Peruvian

merchant sailors at sea long before he discovered their country. His pilot, Bartolomeo Ruiz, was sailing ahead to explore the coast southwards near the equator, when off northern Ecuador his ship suddenly met another sailing vessel of almost equal size, coming in the opposite direction. The northbound vessel proved to be a large raft, and its crew were the first Peruvians ever seen by Europeans. Immediately afterwards a report was sent to Charles V by Juan de Sámanos, and the episode was recorded even before Peru itself had been visited. The event was also narrated in 1534 by Pizarro's own secretary, Francisco de Xeres. From both sources we learn that the large balsa raft was captured by the Spaniards, who found a crew of twenty Indian men and women aboard. Eleven were thrown overboard, four were left with the raft, and two men and three women were retained aboard the caravel to be trained as interpreters for the later voyages.

The balsa raft was a merchant vessel heavily laden with cargo. The Spaniards estimated its capacity at thirty *toneles*, or about thirty-six tons, as compared with the forty tons of their own caravel, which carried only half as many persons as did the balsa raft. The cargo was carefully listed by the Spaniards, and included some items which



could only have come from Peru proper.

The craft was described by Sáamanos as a flat raft, composed of an underbody of logs covered by a deck of slender canes raised so that crew and cargo remained dry while the main logs were awash. The logs as well as the canes were lashed securely together with henequen rope. Sáamanos says of the sail and rigging of the raft :

It carried masts and yards of very fine wood, and cotton sails in the same shape and manner as on our own ships. It had very good rigging of the said henequen, which is like hemp, and some mooring stones for anchors formed like grindstones.

Ruiz now returned to Pizarro with his prisoners and booty, and a few months later a new expedition, led by Pizarro, pushed southwards to the northern coasts of the Inca Empire. On the way to Santa Clara Island in the open Gulf of Guayaquil, Pizarro overhauled five sailing balsas in two days, and opened favourable negotiations with their crews. Then he crossed the Gulf to the Peruvian port of Tumbes, the home of some of his captives. When approaching the coast the Spaniards saw a whole flotilla of balsa rafts standing towards them, carrying armed Inca troops. Running alongside the fleet Pizarro invited some of the Inca captains aboard his vessel, and by establishing friendly relations through his interpreters—those captured from the first raft encountered—he learnt that the whole flotilla was bound for Puna Island which was then under Peruvian rule.

Other balsa rafts came out of the bay with gifts and provisions for the Spaniards, and we learn from Francisco Pizarro's cousin, Pedro, that a little further down the Peruvian coast the Spaniards overtook some balsa rafts, aboard which they found precious metals and some of the clothes of the country, all of which they kept, so that they might take them to Spain to show to the King.

But even before Ruiz captured the first merchant balsa off Ecuador, the Spaniards had already heard rumours about Peruvian navigation from the natives of Panama. The chronicler Las Casas, son of Columbus' companion, who himself went to settle in the New World, stated that the aborigines in Peru possessed balsa rafts in which they navigated with sails and paddles, and that this fact was also known in pre-Conquest times to the oldest son of Comogre, a great chief in Panama, who spoke to Balboa of a rich coastal empire to the south where people navigated the Pacific Ocean with ships a little smaller than those of the Spaniards, propelled by

sails and paddles.

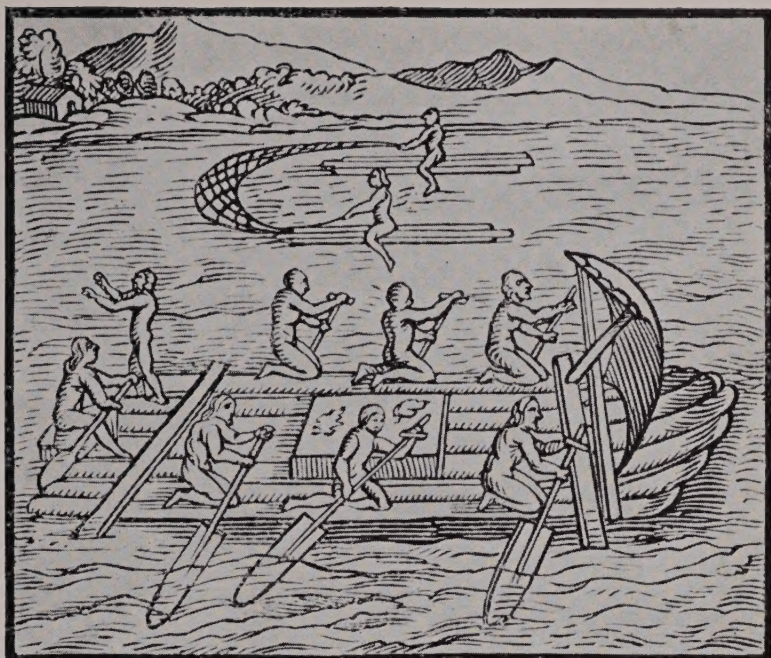
Several of Pizarro's contemporaries recorded details of the craft navigated by the coastal natives of Ecuador and northern Peru : Oviedo (1535), Andagoya (1541) and Zarate, who came to Peru as Royal Treasurer in 1543. Their similar accounts describe rafts made of "long and light logs", an odd number—five, seven, nine or eleven—tied together with cross-beams; the navigation with sails and paddles; the ability of the large ones to carry up to fifty men and three horses. Andagoya, who took part in the earliest expeditions of discovery northwards and southwards along the Pacific Coast, was particularly impressed by the quality of the native henequen rope ("stronger than that of Spain") and the excellent cotton canvas.

The Italian traveller Girolamo Benzoni, who came to Peru about 1540, even included a very primitive drawing of a small-sized balsa raft of seven logs and carrying eight Indians. In his text he states that there were rafts for navigating which were much greater, made up of nine or even eleven logs, and carrying sails which varied according to the size of the raft.

Garcilasso de la Vega, who was of Inca descent and left Peru for Spain in 1560, devotes most of his attention to the wash-through fishing craft of reeds or rushes which were numerous and by far the dominant vessel along the Peruvian coast; he says they usually went from four to six leagues off the coast (fifteen to twenty-four English miles), and more if necessary. He adds that when the natives wanted to convey large cargoes they used the rafts of wood on which they hoisted sails when they navigated the open sea.

Father Cabello de Balboa, who came to Peru in 1566, learnt from the Inca historians that some two or three generations before the arrival of Pizarro, Inca Tupac Yupanqui had descended to the coast, and, selecting some of the best local pilots, had embarked with a whole army upon a vast number of rafts and sailed away from the coast. He was absent for about a year. On the return of the flotilla to Peru, the Inca and his captains claimed to have visited two inhabited islands far out in the ocean. It is well known that it was the rumours of Peruvian merchant sailors with balsa rafts and the account of Inca Tupac's voyage of discovery which prompted the famous navigator Sarmiento de Gamboa to urge the Peruvian viceroy to organize the Mendaña expedition in search of these islands, an enterprise which resulted in the

Pizarro and his companions, sailing southwards to the conquest of Peru, encountered Peruvian vessels of original design. These were log rafts made of balsa-wood, varying from (right) primitive three-log fishing craft to vessels of much larger size propelled by sails, as depicted from memory by Girolamo Benzoni in 1565. His is the first known drawing of such rafts. (Below) An early 17th-century sketch by Spilbergen shows a most important feature of the Indian balsa rafts: the use of centre-boards for navigation



From Benzoni's History of the New World 1565



From Spilbergen's Voyage Round the World 1619

discovery of Melanesia, and subsequently also of Polynesia.

The prominent early historian of Peru, Bernabé Cobo, goes into considerable detail in describing the remarkable qualities of the balsa timber used for the ocean-going rafts, and also the native ability to navigate and swim. He wrote :

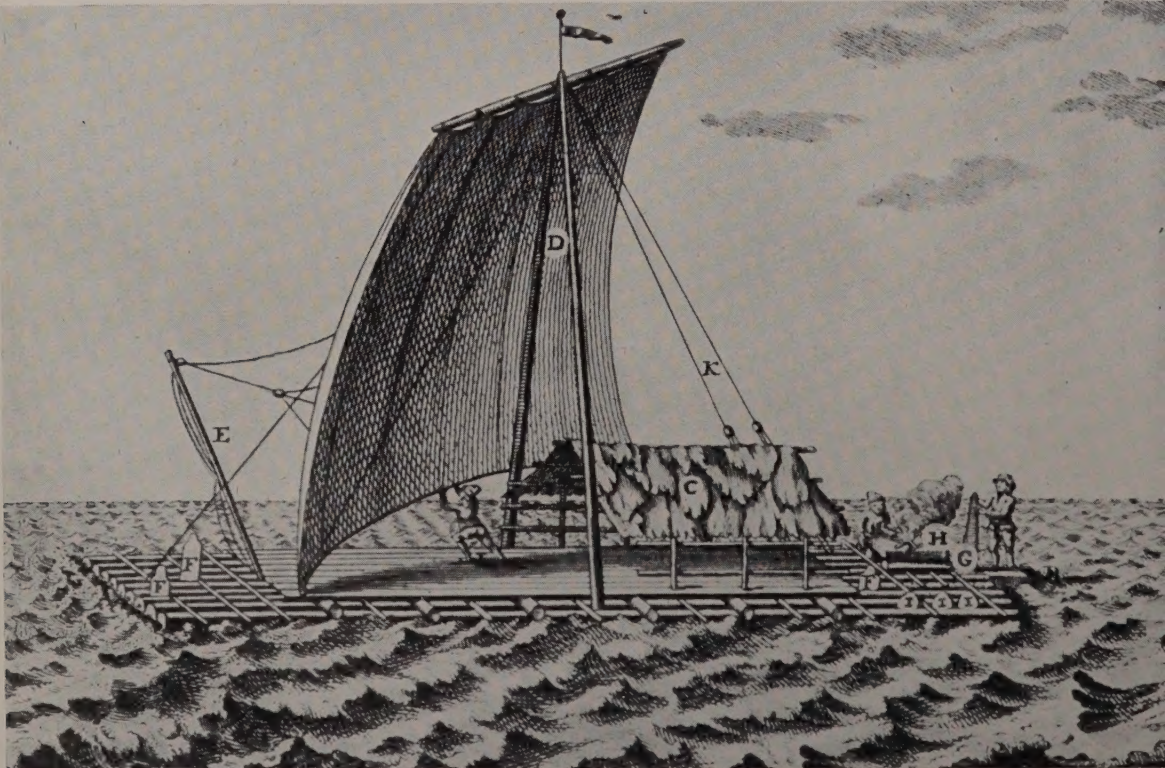
The largest rafts used by the Peruvian Indians living near the forests, like those of the harbours of Payta, Manta, and Guayaquil, are composed of seven, nine, or more logs of balsa timber, in the following manner: The logs are lashed one to the other lengthwise by means of lianas or ropes tied over other logs which lie as cross-beams; the log in the middle is longer than the others at the bow, and one by one they are shorter the closer they are placed to the sides, in such a way that, at the bow, they get the same form and proportions as seen on the fingers of an extended hand, although the stern is even. On the top of this they place a platform, so that the people and the clothing on board shall not get wet from the water which comes up in the cracks between the large timbers. These rafts navigate on the ocean by means of sail and paddles, and some are so large that they are easily able to carry fifty men.

Two Spanish naval officers in 1748, after much study and experiment in Guayaquil Bay, published a report on balsa raft navigation as practised by the Indians, accompanied by this drawing. Among the points illustrated are the centre-boards placed fore and aft (F) and the cooking-place (H)

A peculiar drawing of a balsa raft in Paita harbour, 120 miles south of Tumbes, was done by Spilbergen on his voyage around the world between 1614 and 1617. The interesting feature of this otherwise crude drawing is that it shows a crew of five, three of whom are navigating the raft by means of centre-boards, an art which was completely unknown in Europe until about 1870. Spilbergen states that this balsa raft had been away fishing for two months, and came back with enough provisions to distribute to his whole fleet.

The first unsuccessful attempt to introduce centre-board navigation to Europe was in 1736, after the Spanish naval officers Juan and Ulloa had made a very excellent survey of balsa raft navigation in Guayaquil Bay. They claimed that a native crew with sufficient skill in manipulating the centre-boards could sail as well in any wind as a regular ship.

The principal Peruvian ports for the wooden rafts in Inca times were Paita and Tumbes and other villages on the northern coast near the great balsa forests, but from



From Juan & Ulloa's A Voyage to South America



From Thor Heyerdahl's *American Indians in the Pacific* (Allen & Unwin)

The now almost legendary Kon-Tiki was built by Thor Heyerdahl and his crew in the naval yard at Callao, to a design based on the historical and other information which he had assembled about its Indian ancestors. The raft carried six men for 101 days 4300 miles across the Pacific Ocean

there balsa logs for building rafts were transported by sea and even overland to the desert areas of southern Peru. Valverde has recorded how the Spaniards under Hernando Pizarro, when they advanced to the south shore of Lake Titicaca, found great quantities of large balsa timber transported there on the backs of labourers to build wooden balsa rafts on this southern lake for the Inca Huayna Capac.

Only one practical detail remained unrecorded by the early chroniclers or observers, namely, how the lashings were secured to the slippery logs, and how the individual logs were shaped in the bow and stern; but this information may be gained from the tiny model rafts—or more properly the one-man spirit-rafts—which have been found in the Arica desert graves. They, among other objects, were left there more than a thousand years before the arrival of Pizarro, and show that the lashings were fastened in grooves cut around the logs. They also show that to decrease the water resistance each log was

pointed boat-fashion fore and aft.

By combining historical and archaeological information, we thus possess a fairly accurate knowledge of the construction of the principal craft which permitted aboriginal navigation in Peru and adjacent Pacific waters, and in 1947 I constructed a balsa raft based on this information. It was of average size, and quite small as compared to the specimens described by Sáamanos, and later drawn by Ulloa, Humboldt, and Paris. It was composed of nine 2-foot-thick balsa logs, ranging in length from thirty to forty-five feet, the longest in the middle, and lashed to cross-beams supporting a bamboo deck and an open bamboo hut. A bipod mast, carrying a square sail, five centre-boards, and a steering-oar completed the construction. This was the *Kon-Tiki*, which we launched off Callao harbour in Peru on April 28 with a crew of six men; ninety-three days later the first inhabited Polynesian island was sighted and passed. After a total journey of 4300 miles in 101 days, *Kon-Tiki* grounded on the reef of

Raroia Atoll in the Tuamotu Islands, with crew and nearly all the cargo safe.

The object of the expedition had been to test and study the true qualities and abilities of the balsa raft, and what was more, to get an answer to the old and disputed question whether or not the Polynesian islands were within feasible reach of the raftsmen of ancient Peru.

It proved to be an exceedingly seaworthy craft, perfectly adapted for carrying heavy cargoes in the open and unsheltered ocean. Of all the valuable qualities none surprised and impressed us more than its outstanding safety and seaworthiness in all weather conditions at sea. Next to its unique ability to ride the waves came perhaps its carrying capacity, which, however, was no surprise, since balsa rafts capable of carrying up to thirty tons were described by the early Spaniards.

The theoretical judgments of the balsa raft had deemed it not seaworthy because of the water-absorbent nature of the balsa wood, which would make it sink if not regularly dismantled and dried; also because it was thought that the rope lashings which kept the logs and the whole craft together would be worn through by friction when the great logs began to move at sea. The light and porous wood was also considered to be too fragile should high ocean seas lift the bow and stern up while crew and cargo were weighing upon the central part. Finally, it was considered that a one-and-a-half-foot freeboard on the flat and open raft would leave crew and cargo entirely exposed to the ocean seas.

Our experience provided the answer to these problems, and showed that the ancient culture-peoples of Peru and Ecuador had their good reasons for evolving—and abiding by—this very type of deep-sea-going craft.

Dry balsa wood, as commercially distributed and generally known today, is exceedingly water-absorbent and unsuitable for raft construction, but green balsa wood, put into the sea when freshly cut and still filled with sap, is very water-resistant, and although the water gradually penetrates the sun-dried outer section, the sap inside prevents further absorption. *Kon-Tiki* was still capable of holding tons of cargo when it was finally pulled ashore for preservation more than a year after the expedition.

The balsa logs did not chafe off the rope lashings. The reason was that the surface of the logs became soft and spongy, and the ropes were left unharmed as if pressed between cork. The two-foot-thick balsa logs proved to be tough enough to resist the assault of two storms with towering seas, and

even an emergency landfall on an unsheltered reef in Polynesia.

The secret of the safety and seaworthiness of the unprotected balsa raft, in spite of its negligible freeboard, was primarily its unique ability to rise with any threatening sea, thus riding over the dangerous water-masses which would have broken aboard most other small craft. Secondly it was the ingenious wash-through construction which allowed all water to disappear as through a sieve. Neither towering swells nor breaking wind-waves had any chance of getting a grip on the vessel, and the result was a feeling of complete security which no other open or small craft could have offered. Moreover the shallow construction of the raft, and the flexibility allowed by all the independent lashings, made it possible even to land directly on an exposed reef on the windward side of the dangerous Tuamotu archipelago.

During the voyage a few experiments were carried out with the centre-boards. It was found that five centre-boards, six feet deep and two feet wide, when securely attached, were enough to permit the raft to sail almost at right angles to the wind. It was also ascertained that by raising or lowering centre-boards fore or aft, the raft could be steered without using the steering oar. The raft's crew was quite inexperienced in the use of centre-boards and raft navigation, and an attempt to tack into the wind failed completely, although several of the early chroniclers, and also such accurate observers as Juan and Ulloa 200 years ago, clearly record having seen aboriginal Peruvian raftsmen sailing into the wind by a correlation of sail and centre-boards.

Some of the rafts seen by early Europeans carried merchants with their women and tons of cargo; others were used for army transportation, and still others for fishing expeditions of long duration in the Humboldt Current. Most of these would be well equipped with food and water, because of the barren nature of the Peruvian coast; all would at least have an initial water supply. Our experience showed that sufficient rainwater could be collected *en route* to sustain life; and what was more, a constant supply of fish kept near the raft and provided not only all the food necessary for mere survival, but also a thirst-quenching liquid which could be chewed or pressed from their lymphs.

These observations made it possible to establish the fact that, for the aboriginal Peruvians of high culture, there was no practical barrier between the west coast of South America and Polynesia.